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Contractors and Engineers

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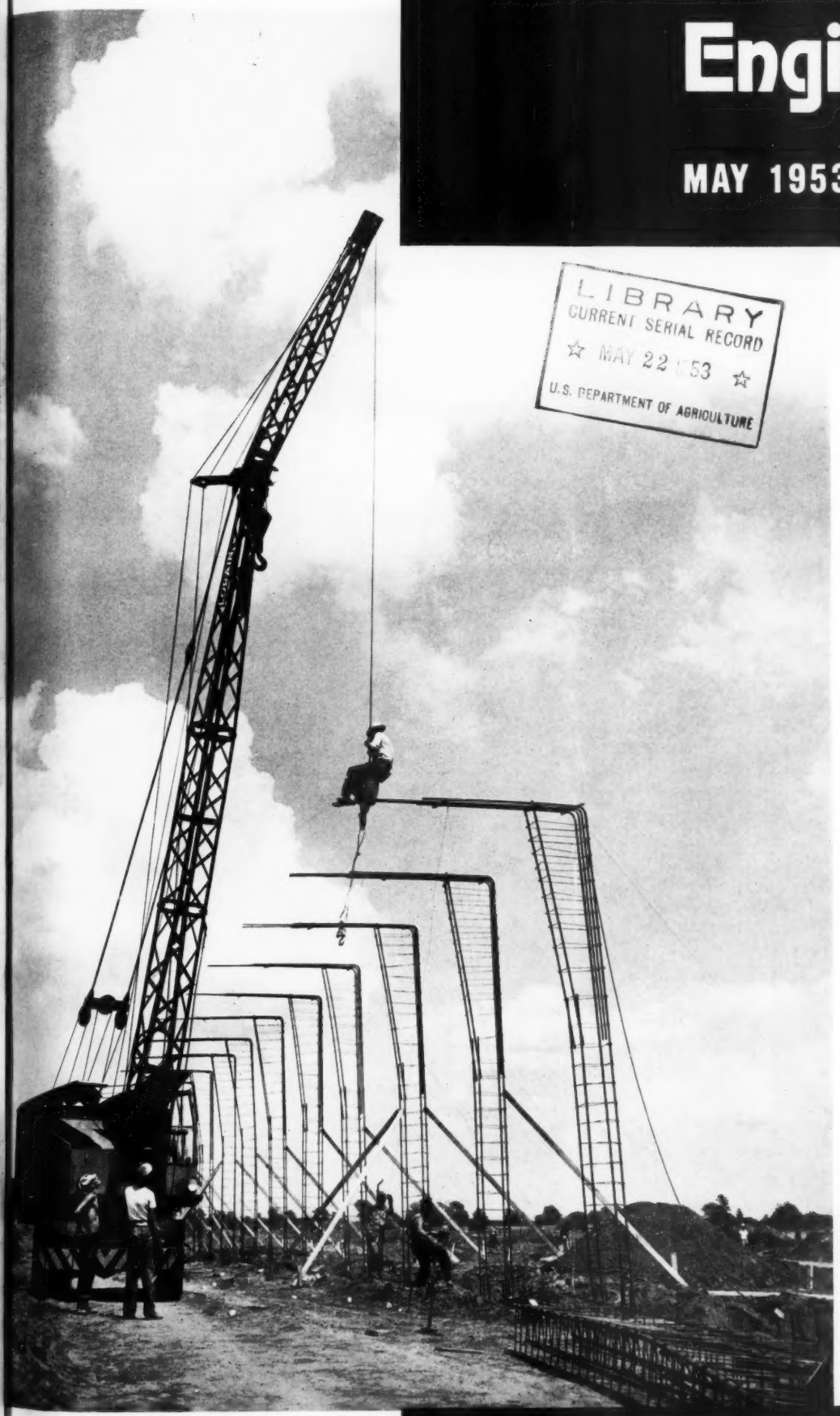

After the Lorain Moto-Crane sets the reinforcing cages for the rigid-frame end columns, a steel erector checks the top bracing ties. The rig has a 30-foot boom and 15-foot jib. Story on this Albany, Ga., warehouse project starts on page 39.

Constructing a hot-mix Texaco Asphaltic Concrete pavement in two courses over old concrete on section of U. S. Route 31-E south of Louisville, Ky. Work done by the Breslin Construction Company of Louisville.

Same surface ... different foundations

for these Kentucky State Highways

When Kentucky constructed these two highway projects near Louisville, the wearing surface laid on both highways was the same—two courses of hot-mix Texaco Asphaltic Concrete. In one case, the foundation which supports the asphalt surface is waterbound macadam; in the other, the existing cement concrete pavement on the highway provides an adequate foundation for the new surface.

A resilient, heavy-duty Texaco Asphaltic Concrete surface for street, highway or airport may be laid with excellent results on a variety of foundations. The two foundations recommended by our engineers as most desirable are coarse-graded asphaltic concrete (black base) and asphalt penetration macadam. However, such foundations as waterbound macadam and gravel, of adequate thickness and properly compacted, provide very satisfactory support for a Texaco Asphaltic Concrete top course.

Whatever your paving project, it is a good idea to investigate the various types of construction available to you through the use of Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils. These types range from heavy-duty asphaltic concrete down to a low-cost surface for light traffic. We have published two booklets which supply helpful information regarding all of these types. Copies can be obtained with no obligation by writing our nearest office.

This heavily traveled hot-mix Texaco Asphaltic Concrete pavement on Kentucky State Route 61 at Louisville is supported by a waterbound macadam foundation. The contractor was the George M. Eady Company of Louisville.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York 17

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TEXACO REG. T. M.

TEXACO ASPHALT

EDITORIAL

Subcontractors on Federal Jobs

Dissatisfaction was shown by the Associated General Contractors of America, Inc., with Senate Bill S-848 at the AGC annual convention in Miami, Fla., this spring. It is a sound indication that contractors propose to do everything they can to keep their industry in their own hands.

The bill seeks to give the Government control of subcontractor relationships on all Federal jobs. The first part of the bill—applicable to Federal-government cost-plus construction contracts only—provides that if the general contractor holding such a contract is not qualified by previous experience to perform mechanical-specialty work, he must subcontract this work to independent qualified mechanical-specialty subcontractors. The second part of the bill relates to lump-sum construction contracts made by the Federal government and does not require any contractor to be qualified by experience. It provides, however, that the general contractor shall state in his bid (1) the names of the mechanical-specialty subcontractor, if any, that he intends to use; and (2) the cost to the contractor of the work which is to be subcontracted. Provision is made for the substitution of a different subcontractor in the event of default by the one named, if the substitute is acceptable to the Government.

Contractors, as manifested at the AGC meeting, feel pretty strongly on this subject. Passage of such a bill would, in the opinion of many members, require the contractor and the Government agencies concerned with construction contracting to change in part their long-established way of contract. The bill is seen as an attempt to regulate the intimate and internal affairs of the construction industry by Federal law.

More contractors are returning to the market to bid now that Government controls are being relaxed, and this has caused a sharp rise in competition. In spite of this (one contractor remarked, "Intensity of competition is intensely intense and no fun or profit on a market such as this"), contractors still feel that their only salvation lies in freedom of action.

The AGC meeting brought out a general feeling of optimism throughout the country in the matter of new construction. This in itself is a healthy sign. As regards the details of who does what on each particular job, surely that decision is up to the successful winner of a contract award.

Gasoline Monopoly on the Toll Roads

The old question of private enterprise versus state is never far from the surface of things. It was touched upon in a recent address by R. H. Collacott, Assistant to the Chairman of The Standard Oil Co. (Ohio), to the Ohio Petroleum Marketers Association.

Briefly, the position on the new Ohio Turnpike is that the operation of gasoline stations is allotted on a monopoly basis. The Commission calls for bids, then allocates certain stretches of the turnpike to each successful bidder. No one else may compete on that particular stretch, and the Commission receives royalties on the sales of gasoline. This plan, Mr. Collacott believes, is a trespass, however slight, on the fields of free enterprise. It means that an oil company, even if it can afford the large outlay required to put in a bid, finds on receiving the franchise that it has merely bought the right to participate in a limited market, at an occupancy expense out of all proportion to that which it experiences in its normal markets.

As against this, it must be remembered that a turnpike commission is bound to develop adequate revenue to cover operating and maintenance costs, and in addition the impressive amount required to pay interest on and amortize the bonds issued for highway construction.

Mr. Collacott holds that revenues other than tolls received by the various turnpike commissions are very small and that the Ohio Turnpike Commission (which is his main consideration) is not under any great pressure to seek the absolute maximum revenue. It could therefore afford to adopt measures other than concession and monopoly if suggestions appear to justify it.

There are alternatives to the monopoly system. One which Mr. Collacott favors is carried out on a short stretch of the Garden State Parkway in New Jersey. Here commercial zones or districts are established at intervals, laid out so as to require quite a departure from the highway. In the deep U-shaped area provided there is room for as many as four lots of adequate size set out for service stations. These lots are then sold by selection and bid either to an oil company or to an individual. This "Indian Village" scheme numbers among its advantages a choice of gasoline brands for the consumer; the provision of competition between commercial concerns and the reduction of competition between the turnpike and outside facilities at interchanges; and the divorce of the restaurant business from that of the oil companies, so that the latter do not have to underwrite a business with which they have no connection.

The whole question seems to be one which would benefit by frank discussion between the turnpike commissions and the commercial enterprises concerned.

Contractors and Engineers

the NEWS magazine of the construction industry

May, 1953

Airports
Runway is extended at Bradley Field, Conn. 57

Bridges
Tides a problem in bridge-pier construction 51
Structural plates replace wooden deck 72

Building Construction
Building huge warehouses for U. S. Marine supply depot. Two-part article with pix 36
Sliding forms speed bleach-plant construction . . . 48
Lift-up slabs for university building 66

Convention Report
AGC Convention in Miami, Fla. 126

Flood Control
Arizona county starts flood-control job 78

Highways
Portable asphalt mixer used in paving 20
Heavy grading on Rhode Island highway relocation 29
Gravel road stabilized by rock salt 33
Lower construction costs with larger equipment on big jobs. Story, pix 88

Management
Water-heating system at ready-mix plant 112

Paving
A rubber-road job in Massachusetts 6
City is by-passed with 4-lane concrete highway . . . 16
Old pavement widened and surfaced with plant-mix 24
Concrete laid on road relocation 61
Paving cracks caused by hot, dry weather 94

Safety
Advice for unloading, transporting, erecting, and operating asphalt plants 120

Subway
New York subway design and construction—Part I (to be concluded next month) 106

Tunnel
Tricky excavation problems on sewer tunnel . . . 115

Water Supply
Steep slopes are paved, and tunnels driven for Los Angeles reservoir. Story, pix 8

Departments
Avoid Legal Pitfalls 99
Convention Calendar 102
Distributor Doings 83
Editorial 3
Manufacturer Memos 130
Names in the News 7
News and Views 4

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NEWS AND VIEWS

of the construction industry—engineer shortage, roads, schools

Shortages of one kind and another have been the subject of comment at various times on this page. The supply of steel (strikes notwithstanding) and other materials is looking up, but it's the engineers who are still in demand. Schools and colleges across the country are engaged in recruiting programs designed to meet the **critical shortage of trained engineers,** and the latest report is that college engineering enrollments increased in 1952 to 51,631.

In the meantime, while these freshmen mature, the drain on the country's engineers goes on. The armed forces inevitably absorb many of them, and the Engineering Manpower Commission of the Engineers Joint Council is seeking to mitigate this in two ways. First, the Commission is pressing for all engineering graduates entering the armed forces to be employed as far as possible in an engineering capacity; secondly, EMC is alerting every graduate engineer soon to leave the military establishment, and is impressing on these young men the need for their talents in the civilian and defense industrial world.

Highways and how to pay for them loom large on the horizon. Toll roads are meeting with a mixed reception. A **private-enterprise scheme** for a 200-mile toll highway in Virginia suffered a setback when the State Highway Commission adopted a resolution declaring it would not accept capital stock of any turnpike corporation. Apart from "grave doubts" on the part of the State Attorney General as to the legality of the State accepting such stock, public opinion was said to favor the construction and operation of toll roads by the State Highway Commission rather than by a private corporation. An argument against private enterprise was that bonds issued privately would constitute a moral obligation on the State in case the corporation defaulted. In reply to this, the corporation asserted that the turnpike could be built without any tax money and there would be no legal or moral obligation on the State.

Other highway news concerns taxes. Twenty-two states are considering increases in their motor-fuel taxes and seven have vetoed proposed increases. There is a growing movement to keep the revenue from fuel taxes at home in the individual state, and resolutions have been passed in several states to memorialize Congress for **immediate repeal of the Federal tax on gasoline.**

Size and weight of trucks on the highways is a question that is much in evidence. The trend is to increase the maximum size and weight limits and several states have passed laws accordingly. Idaho has repealed its ton-mile tax law and substituted a truck-licensing bill whereby trucks will pay a flat fee ranging from $10 for those under 6,000 pounds up to $310 for those over 40,000 pounds.

A major change has taken place in the Bureau of Public Roads. **Thomas H. MacDonald,** Commissioner for nearly 34 years and the only Commissioner there has ever been, retired this spring and **Francis V. du Pont** has succeeded him. Mr. du Pont's service with the Delaware State Highway Department lasted from 1922 to 1949, for 23 years of which he was Chairman.

Our congratulations to New Jersey's Garden State Parkway, which now boasts a Newsletter of its own. The first issue of "Garden State Parkway News" came out in March.

Our own road programs should not make us lose sight of those in other countries. New construction in South America is probably the greatest in volume in its history, according to a report by the International Road Federation. All told, new roads on that continent exceed 8,000 miles. In Europe eight countries—Austria, Belgium, France, Italy, Germany, Luxembourg, the Netherlands, and Switzerland—have agreed on an immediate start for a system of international routes.

Turning to construction as a whole, the supply of funds for 1953 will be **greater than for 1952,** according to the Construction Advisory Council, though earlier forecasts were perhaps over-optimistic.

The increasing population has emphasized the need for **more schools,** and Washington, South Carolina, Michigan, New York, Vermont, and North Dakota have put in force or are considering bond issues for their school-building programs. State institutions, residential, and office buildings all figure in this year's building programs.

The National Safety Council's highest award went to F. H. McGraw & Co., New York, N. Y., for its outstanding safety record on the AEC project at Paducah, Ky. C. H. Patterson, Safety Engineer (left) with Jack Curlee, McGraw's Construction Superintendent.

Water pollution and its prevention is the subject of proposed new legislation in many states. The installation of new sewage-treatment facilities, the charging of fees to various bodies that use such facilities, and the institution of a fine against companies responsible for oil pollution of state waters are some of the measures under consideration.

A state constitutional amendment to prohibit construction of **flood-control dams** in the Adirondack Forest Preserve, New York, was approved by the State Legislature and will go to the voters in November.

While on the subject of dams, there's a record-sized one planned for Egypt, and West German industrial concerns are going to partake in the building of it. The Sadd-el-Aali Dam on the River Nile will change the face of Egypt, according to the German engineers.

Another big foreign project is the overhaul of the **Panama Canal,** notoriously inadequate for the present flow of traffic. This initial project—to be completeld by 1956—will permit overhaul and repair of the lock culverts without interruption of service and shorten the time necessary to fill and empty one lock chamber while its twin is emptied for overhaul.

Finally, if anyone is laboring under the delusion that the field of engineering and construction is sacred to the male, let him think again. Our congratulations to Miss Janice Button, newly named Editor-in-Chief of **The Cornell Engineer.** An engineering physics student at Cornell College of Engineering, Miss Button is in charge of this student and alumnus magazine. And our gallant neighbors south of the border have issued drivers' licenses to women for the operation of trucks in Mexico. Vivan las senoras!

The final unit of the 270,000 kw Wolf Creek Power Plant is now in operation. E. J. Albrecht Co., Chicago, Ill., was prime contractor for the Corps of Engineers in this scheme for the development of the Cumberland River Basin.

Reinforced Concrete Lessens Atomic Damage

No one likes to contemplate the structural damage that would result from the dropping of enemy atomic bombs several times as powerful as those dropped by us on Japan in 1945. But someone has to, as was indicated by Harry L. Bowman, consultant to the Atomic Energy Commission, when he addressed the 23rd Annual Convention of the Greater New York Safety Council. He told the Council that the United States has in its atomic stockpile bombs "several times more powerful than the bombs which were used in Japan" and that it must be supposed that the bombs of a potential enemy would be equally powerful.

Mr. Bowman, who is also Professor of Civil Engineering at Drexel Institute of Technology in Philadelphia, addressed the Convention's disaster-control session on the kinds of building material best calculated to minimize the effects of an atomic explosion.

Illustrating his points with slides of the destruction from high-explosive and atomic bombs in World War II, and of tests performed on full-scale structures at Eniwetok and the Nevada test site, Mr. Bowman expressed the opinion that reinforced concrete was, in general, an excellent material to resist bomb effects. It does, however, exhibit certain weaknesses under high-explosive attack. The detonation of a bomb after penetration into such a structure leads to reversal of the direction of loading and a column may be placed in tension with resulting failure in a splice, or the roof may be lifted from its supporting columns. Again, the negative phase of an atomic blast will cause negative moment to extend throughout the mid-length of slabs, beams, and girders. These effects can be defeated by the welding of column rods at splices; the anchoring of the roof to the columns; the use of vertical stirrups instead of bent rods (since the latter are in, rather than across, the cracks which tend to form); and the provision of some negative reinforcing steel in beams throughout their lengths to resist the reversed loadings. A structural-steel frame, either riveted or welded, is free from these weaknesses.

As regards materials for use in walls, Mr. Bowman pointed out that all blocks—brick, terracotta, concrete, and glass—are poor in bomb resistance as their joining mortar is usually weak, their walls are poorly bonded to the building frame, and bending strength is lacking. Worse still, they become missiles. Any type of metal covering is undesirable, as such coverings transmit large loads before they tear loose to become dangerous missiles, too.

Summing up, Mr. Bowman said that the inevitable answer was that walls should be of integrally poured reinforced concrete. As an alternative, lightweight materials which shatter readily under blast are desirable (plain glass and sheet asbestos are examples). But these materials should not be used if people are working adjacent to such walls.

"The bomb resistance of all types of structure", concluded Mr. Bowmen, "can be increased by the liberal use of bracing, the provision of connections which carry a reversal of stress, and the widespread use of continuity."

Structural Engineering Trends Published

The proceedings of the Second Structural Engineering Conference, held in Urbana, Ill., from November 12 to 14, 1952, have been published in book form. Fifteen illustrated chapters cover subjects such as prestressed concrete, steel structures and connections, welded structures, designing for dynamic loads, and methods and interpretation of soil exploration.

The volume, prepared by a committee from the University of Illinois Civil Engineering Department, was published by Hutner and Wroughton, 523 E. Main St., Danville, Ill., and the volume is priced at $3.75.

Construction Inspectors Wanted in St. Louis, Mo.

Inspectors to supervise construction of levees and under-seepage relief wells for flood-protection projects in progress along the Missouri River between Wood River, Ill., and Cape Girardeau, Mo., are now being employed by the St. Louis District, U. S. Army Corps of Engineers.

Salaries range from $3,410 to $4,205, in addition to regular Civil Service benefits. Applicants with four to five years of construction experience should apply to the District Engineer, 420 Locust St., St. Louis, Mo.

Virginia Road Allocations

Virginia's secondary roads are to be maintained and improved by allocations totaling $28,000,000 during the fiscal year beginning July 1, it has been announced by the State Highway Commission. The 1953-54 allocations include Federal-Aid funds with state funds to match them, in addition to regular state funds and special state funds.

"Gosh, Burton, it looks like your wife!"

For Public Service

in behalf of modern highways

We are proud of being awarded the 1952 Silver Anvil Trophy of the American Public Relations Association for meritorious public service in behalf of a modern highway system for America. The "Better Roads" campaign, sponsored by Goodyear in national magazines and newspapers, played an important part in the current nationwide drive for improved highway transportation facilities. It is one more example of the wide range of Goodyear's activities to be of greater service to every user of motor transportation.

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P. W. Litchfield

Chairman of the Board, The Goodyear Tire & Rubber Company, Inc.

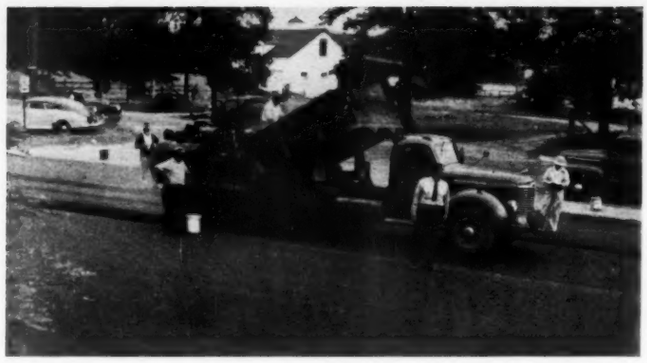
(This timely quotation keynoted Goodyear's award-winning "Better Roads" campaign.)

GOODYEAR

America needs better, safer roads. Let's bring them up to **PAR**

More Rubber Roads For Massachusetts

Public Works Department Handles Problems in Resurfacing With Mix Containing Synthetic-Rubber Powder



This Adnun paver took part in the resurfacing job on U. S. 6. A bituminous-concrete mix, containing synthetic-rubber powder, was used. *C. & E. Photo*

• AS part of its rubber-road research program, the Massachusetts Department of Public Works resurfaced 1.7 miles of U. S. 6 last fall with bituminous concrete containing synthetic-rubber powder. Standard bituminous concrete was used to resurface several miles on either side of the rubber test section to provide a future comparison.

Heavily traveled U. S. 6 between Providence, R. I., and Fall River, Mass., had been in need of repair for some time. The original reinforced cement-concrete pavement was built in 1931. It was 40 feet wide and had 3-foot hardened shoulders.

The $130,000 resurfacing contract, awarded to William H. Sherry of Fall River, Mass., called for two 1¼-inch courses laid 46 feet wide. The total quantity of rubberized bituminous concrete was 7,850 tons.

Sherry did the job in 4 strips using an Adnun paver and two 10-ton 2-wheel tandem Buffalo-Springfield rollers. One Ford and two International trucks hauled the mix from the plant less than a mile away.

Rubber Mix

The specifications required that one-half of the 1.7-mile test section contain 7.5 per cent by weight of GR-S synthetic-rubber powder added and dispersed in the asphalt by the following procedure:

The specified amount of powder is added at a minimum temperature of 200 degrees F with suitable agitation. It is sifted through a ¼-inch-mesh sieve into the mixer to prevent lumping. The temperature of the mixture is then raised to 250 to 275 degrees F and the mixing is continued for a minimum of 2 hours. The asphalt containing the dispersed rubber powder is then mixed with the aggregate in the usual manner.

The GR-S synthetic-rubber powder is prepared from standard GR-S synthetic-rubber latex in such a manner as to produce a dry powder, at least 50 per cent of which shall pass the 40-mesh sieve and 100 per cent the 20-mesh sieve.

Both the rubber and the asphalt were supplied by American Oil Products in Somerville, Mass., and hauled to the plant in 4,000-gallon tank trailers.

The thick texture of the rubber asphalt presented a handling problem at the plant. It was necessary to keep the material hot continually, or it would not flow. The contractor used a pump on the truck to circulate the asphalt back and forth between the trailer and the oil-heated storage tank. Another pump circulated the hot asphalt between the storage tank and the mixer box.

The 2,000-pound Cummer plant was fed aggregate through a system of conveyors. An eccentric feeder proportioned the sand and stone before they entered the dryer. A Cleaver-Brooks 25-hp boiler supplied steam to all jacketed units.

The approximate mix percentages by weight were as follows:

Base Course	Per Cent	Top Course	Per Cent
Sand	22	Sand	39
Stone, ⅜	7.5	Filler	2
Stone, ½	16.5	Stone, ⅜	52.5
Stone, ¾	49	Asphalt	6.5
Asphalt	5		

Personnel

Jack Medeiros was Superintendent for the contractor. F. A. Chase was District Engineer for the Massachusetts Department of Public Works, which is headed by William Tuttle, Chief Engineer. Edward S. Coburn was Resident Engineer.

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Names in the News

George F. Ferris, the new President of Raymond Concrete Pile Co.

Geo. F. Ferris Is President

Raymond Concrete Pile Co., 140 Cedar St., New York 6, N. Y., foundation and international heavy construction firm, has announced the election of George F. Ferris as President. Mr. Ferris succeeds William V. McMenimen, who has assumed the post of Vice Chairman of the Board of Directors.

Since 1946, Mr. Ferris has served in the capacities of Director, Vice President, and General Manager of Raymond Concrete Pile Co. He was previously associated with Turner Construction Co., New York, N. Y., and during the war served as Chairman of the Operating Committee of Contractors, Pacific Naval Air Bases.

District Engineer Retires

After 43 years of service with the New York State Department of Public Works, Joseph J. Darcy, District Engineer in charge of the Long Island District retired on April 11.

Mr. Darcy's early service included engineering work on New York City subways and state-highway construction projects. Since Mr. Darcy became District Engineer of the Long Island area, almost the entire present system of modern highways, parkways, and expressways on Long Island and in the metropolitan area has been built. Mr. Darcy served as Consulting Engineer for the Detroit Industrial Defense Expressway, and conferred on development reports on Idlewild Airport construction. Milton E. Goul succeeds Mr. Darcy in the $11,925 post of District Engineer in the Babylon office.

Sand and Gravel Elections

New officers and Board of Directors recently began serving the National Sand and Gravel Association, Washington, D. C., as a result of the organization's 1953 elections. Albert R. Shiely of J. L. Shiely Co., St. Paul, Minn., is the President of the Executive Committee. He will be assisted by John W. Murphy of Union Sand and Gravel Co., Spokane, Wash., who is the Vice President, and Roy E. Weaver of The Lincoln Sand and Gravel Co., Lincoln, Ill., the new Secretary-Treasurer.

Engineer Matteson Retires

On March 1, 1953, Byron W. Matteson retired as Division Engineer for the states of Colorado, New Mexico, Utah, and Wyoming. With headquarters at Denver, Colo., he has worked in that area for the U. S. Bureau of Public Roads since 1938.

Last year Mr. Matteson received the Department of Commerce Gold Medal Award for outstanding work in national highway development.

Reindollar Joins Eng. Firm

Gannett Fleming Corddry and Carpenter, Inc., a Harrisburg, Pa., engineering firm, announces the association of Robert M. Reindollar of Baltimore, Md., with their company. Mr. Reindollar, formerly Chairman of the Maryland State Roads Commission, was recently elected President of the American Road Builders' Association.

Concrete Association News

The recently held elections of the National Ready Mixed Concrete Association, Washington, D. C., have resulted in a change of officers and a new Board of Directors. Now serving on the Executive Committee are Herbert G. Jahncke, President; Robert C. Collins and Louis C. Schilling, Vice Presidents; and Robert Mitchell, Treasurer.

YOU hold the watch!

If you want to know whether you're getting the most out of your earthmoving rigs, here's how to find out.

On your own job, under any conditions you choose, *time* the work cycle of a Cat* DW21 Tractor and No. 21 Scraper against any other make of similar equipment. Or, if you're using four-wheel tractors, make the same comparison with a DW20 or a DW10 unit. Check the yardage handled in an hour—or a day.

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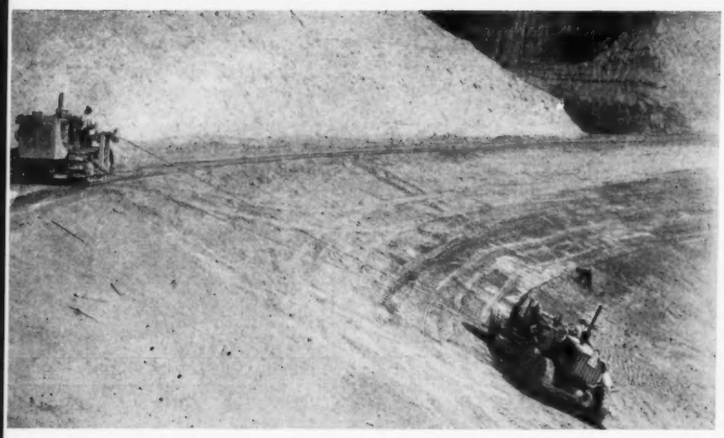
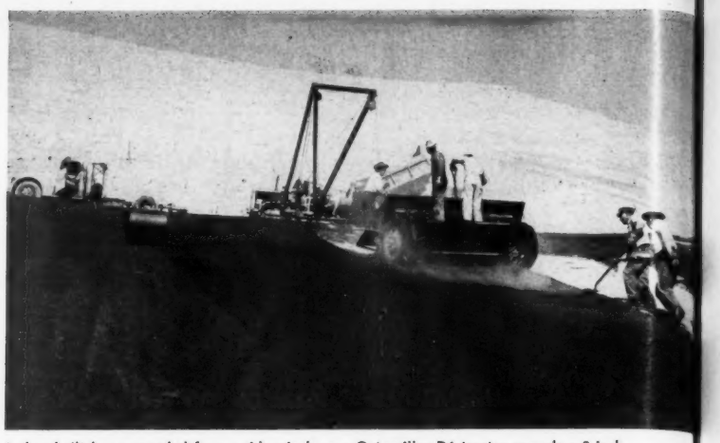


A Caterpillar grader shapes a steep 2 to 1 slope as the D8 tractor above assists the grader with a 2-part line.



A shop-built box suspended from a side winch on a Caterpillar D4 tractor spreads a 3-inch asphalt mat.

Pave Steep Slopes for Water Reservoir

By RAY DAY

• NESTLED carefully between the hills just north of Eagle Rock in Los Angeles, a new 257-acre-foot water reservoir has taken shape despite engineering and construction difficulties. Eagle Rock Reservoir has not been an easy job for the engineers to design or the contractors to build, because the lack of working room made it difficult indeed to fit the paved earthen structure into the hills.

Conceived as a part of the distribution system of the Los Angeles Department of Water & Power, the Eagle Rock Reservoir will act as a surge or temporary fluctuating storage reservoir for Metropolitan Water District water entering the system a short distance away. Kemper Construction Co. of Los Angeles has the $1,380,702 contract for building the structure and appurtenant tunnels.

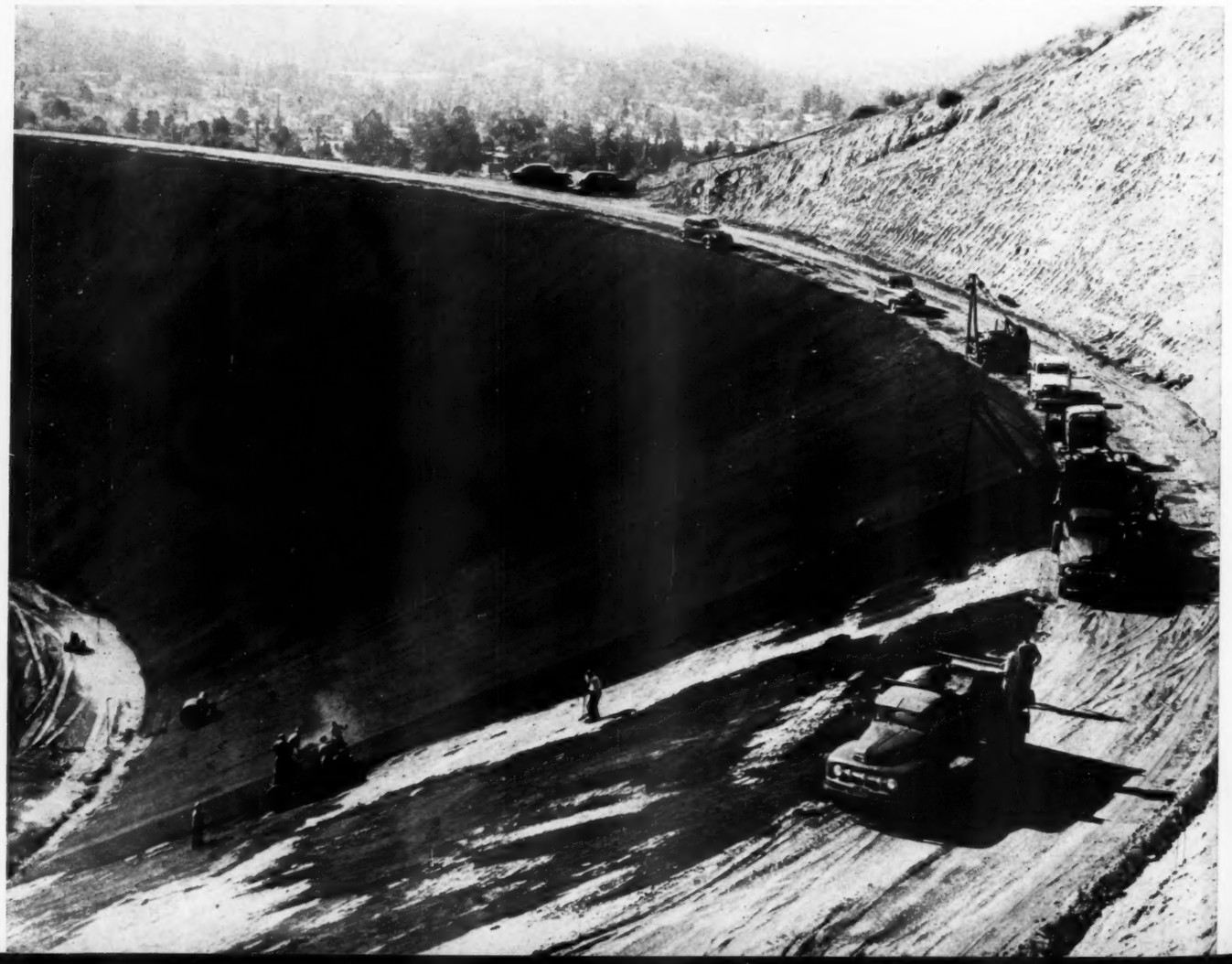
Kemper's crews, along with various subcontractors' forces, have pushed the job along at such a fast pace that the chances are it will be completed before the scheduled date of July, 1953. This good showing has been made in spite of congestion, of construction close by a city residential area, of hard-to-dig material, and an unstable formation along the south side of the reservoir which had to be undercut and backfilled with better material. One of the more unusual aspects of the job was the paving of a 131-foot 2 to 1 slope with asphaltic concrete. According to engineers with the Department of Water & Power, it is the longest continuous slope that steep the Department has ever paved.

Elliptical in Shape

Eagle Rock Reservoir resembles an oversize fancy swimming pool, because it was designed elliptically to fit as much storage as possible in the hilly terrain at the Eagle Rock location. The floor of the reservoir is at an elevation of 900 feet above sea level, and the height of the spillway berm is 957.5. At high-water elevation, the reservoir surface will cover 7.24 acres, with impounded storage capacity of 256.95 acre-feet.

Three sides of the structure rest generally in undisturbed cut sec-

Overall view of the slope-paving operation. Up to 100 linear feet of the 131-foot slope was paved in a single 8-hour shift. Part of the reservoir's dike section in the background.



Nestled in the Eagle Rock hills, the new reservoir takes shape. The asphalt lining is half finished, and work nears completion on the outlet tower.

tions, in formations ranging from clayey material to decomposed granite. The remaining end consists of an earth dam, highly compacted by special heavy sheepsfoot rollers, making the reservoir monolithic. A 3-inch compacted porous asphaltic-concrete pavement covers the sides and bottom of the reservoir, while the reservoir crest and roadway areas are covered by conventional asphaltic concrete containing more No. 4 minus material than the lining mix.

Reinforced-concrete inlet and outlet towers are also a part of the reservoir, as are three tunnels. One tunnel, about 1,100 feet long, carries an 84-inch concrete-encased steel inlet pipe. Two short 340-foot tunnels carry 72 and 48-inch outlet pipes, also encased in concrete, from the outlet tower. After construction, the graded area and slopes are to be protected by seedings of native shrubs, California poppies, and wild mustard. This will blend the reservoir nicely into the nearby residential area just below the structure.

Small Tunnels, but Tough

In spite of the small size of the tunnels, they were not easy to drive. The formation pierced by the tunnels was a badly fractured granite nearing the decomposition stage, requiring steel supports as each heading advanced. Tunnel excavation was a

(Continued on next page)

DUDGEON HYDRAULIC JACKS

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Gradall turns a limited operation into a profitable business!

GRADALL'S advanced design, plus the foresight and determination of two contractors, has made a marginal slag pit operation at Dover, Ohio, a money-making business.

Farbizo Slag, Inc. was organized in 1948 to work a 38-acre slag pit which they had leased – land that had originally been a swamp. Most of the pit was already worked down within a few feet of the bottom, and these lower layers were compressed until they were nearly as hard as concrete. Attempts to expose a working edge by blasting only resulted in uncovering the old swamp, making it impossible to approach the exposed face of the slag without crossing the swamp. Also, continued blasting and loading was not economical.

It was then they saw a Gradall in action—and the solution to making good on their investment. Parked on top the slag, the Gradall exerted its powerful down-pressure and bucket "wrist" action to cut back into the slag, efficiently removing it right down to the swamp.

Business prospered and within a few months Farbizo bought a second Gradall. Not only have the machines increased production, but they have also extended the life of the pit many years by making it possible to remove slag right down to the pit floor.

This story is typical of how a Gradall's efficiency and many uses have "paid off" for its owner. Many smaller contractors have similarly been able to enlarge their operations —to take on larger, more profitable contracts with this multi-purpose machine. Larger contractors keep Gradalls busy on many and varied "clean-up" jobs formerly done only by hand labor. But let your nearest Gradall Distributor show you how a Gradall can build profits for you—contact him for a field demonstration.

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Gradall
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Pave Steep Slopes For Water Reservoir

(Continued from preceding page)

short-round, no-overbreak, light-loading affair which was carefully supervised.

The tunnel carrying the 84-inch steel pipe, for example, was driven approximately 9 feet in its horseshoe-type dimensions. Into this tunnel face a pattern of 30 holes was sunk to pull about 4 feet of rock per round. Drilling equipment was mounted on an Ingersoll-Rand jumbo, and consisted of a pair of Gardner-Denver 79 drifters, powered by Gardner-Denver 365-cfm compressors stationed outside the tunnel. Ingersoll-Rand Carset bits were used to sink the various cut, reliever, breast, arch, and lifter holes. Light shots of 30 per cent Hercules gelatin powder were loaded into these holes, and equipped with delays to control the shots gradually from the center cut to the outer perimeter of the bore.

As tunnel excavation advanced, slip zones and ground water were encountered, and at one point about 80 gpm was being pumped out of the hole. But excavation progress was good, and an average showing of 2 rounds per shift was made. Tunneling was on a 3-shift 24-hour 6-day basis.

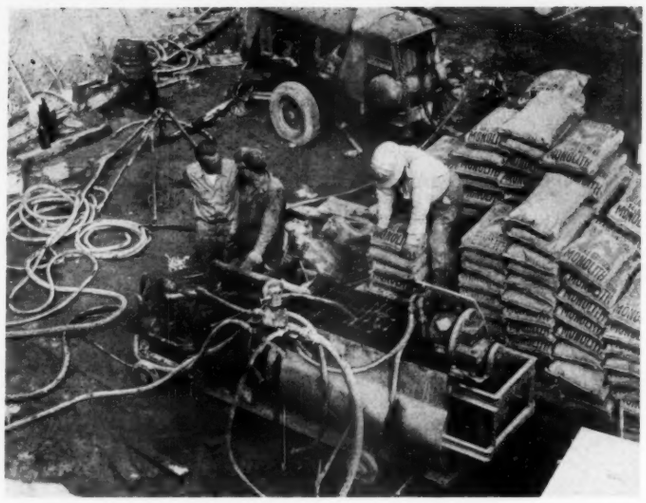
Broken rock from each heading was removed by a Gardner-Denver No. 9 mucking machine, loading to cars on a 24-inch-gage railroad track. Standard car passes were used in making up the trains, which were pulled by a General Electric locomotive. Steel ribs for bracing the tunnel walls were set in place on 3 and 4-foot centers, and consisted of 4-inch WF 10 and 12-pound members.

Tunnel excavation in the shorter bores was similar, with the same general line of equipment. Tunnel sections in the short section were somewhat smaller, consisting of an 8-foot horseshoe shape.

All of the steel pipe was supplied by American Pipe & Steel Co. of Alhambra, Calif. After it was trucked to the site, it was unloaded by a Link-Belt Speeder truck crane and was transported into the tunnel position on a small dolly, equipped with four hydraulic rams to handle and spot the pipe. The pipe was then welded together after being checked for true position. Temporary ties to the bracing steel helped to hold the steel pipe in position until it was welded and encased with concrete.

A 2-yard Flocrete pneumatic concrete placer was used with a great deal of success in placing the encasement concrete. It is a mobile unit (see C. & E., April, 1953, pg. 77), which, after being charged with fresh concrete at the tunnel portal, was transported to the point of placement by a Caterpillar diesel-electric locomotive. The concrete batches were placed through a 6-inch slick line, embedded about 3 feet into the concrete. Bulkheads for the end of a day's pour were built up to the spring line of the pipe, and the concrete pours were sloped at the natural angle of repose from that point up. The advance rate of pour was approximately 20 yards per hour.

The locomotive was used to move the placer, bringing it out of the tunnel to receive mixed batches of concrete from the truck mixers which delivered this material to the job. There was a quick-coupling device on the placer for almost instant connection or disconnection with the discharge of concrete from the locomotive carrier. It consisted of a gooseneck of 6-inch-diameter flexible rubber hose attached to a 6-inch steel pipe running to the point of pour.



This pressure-grouting setup sealed off the voids behind the concrete-pipe encasement in the tunnels.

The concrete encasement mix was a 6-sack 3,000-pound design, using a special Type II cement made by Monolith Cement Co. which minimizes alkali reaction in reactive aggregates. The aggregates and sand were furnished by Arrow Rock Co., and altogether, including the structural concrete in the control towers, about 7,500 cubic yards was batched.

Of special interest to tunnel builders is Kemper's custom-made batch plant, which was fabricated by a

HOW CONTRACTORS* SPEED W
ON CHIEF JOSEPH DA

...with TEXACO SIMPLIFIED LUBRICATION

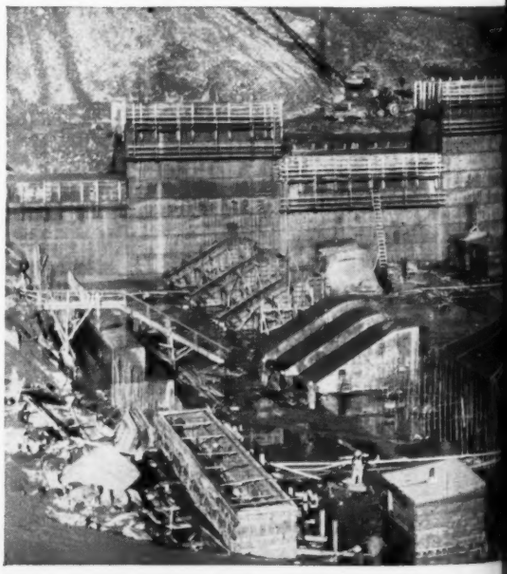
CHIEF JOSEPH BUILDERS,* a combine of four principal contractors, is doing the construction work for Chief Joseph Dam proper. In addition to a vast amount of heavy construction equipment—bulldozers, scrapers, trucks, shovels, etc.—the project involves tremendous cableways, one of the biggest refrigerating plants in the Northwest, a giant gravel crushing plant, and much more besides.

All this equipment and machinery is lubricated exclusively with Texaco. The Texaco Lubrication Engineer servicing this project worked out for the Chief Joseph Builders a Simplified Lubrication Plan – by which all major lubrication is handled with only six Texaco Lubricants.

"The Texaco Simplified Lubrication Plan," says Chief Joseph Builders, "has been a big help to us. By reducing the number of lubricants we have to use, we have substantially reduced the chance of error in application, and have speeded our maintenance work. And, of course, the always-fine quality of Texaco Lubricants has been an important factor in keeping our equipment on the job and our maintenance costs low."

Let a Texaco Lubrication Engineer work out a Texaco Simplified Lubrication Plan for *your* next project. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



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on television —
the TEXACO STAR THEATER
starring MILTON BERLE.

See newspaper for
time and station.

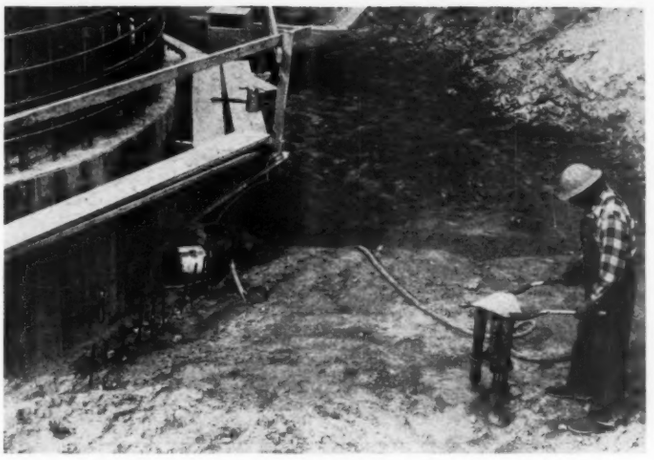
TEXACO

CONTRACTORS AND ENGINEERS

Los Angeles manufacturer to Kemper's specifications. Several years ago Kemper tried to take a standard model batch plant into Colorado, only to find that its 9-foot maximum dimension was not legal for highway hauling. The present batch plant was built to be legal in all the western states, with 8-foot maximum dimensions knocked down for shipment. Despite its portability and its small size—it was designed especially for tunnel lining—the plant has an average output of about 45 to 50 cubic yards an hour.

Half-Million-Yard Dirt Job

The biggest single project item, of course, was a 500,000-cubic-yard chunk of dirt work, coupled with an additional 100,000 cubic yards of excavation which went into a stockpile. This earthwork was necessary to grade the reservoir into three sidehills on various sides of a natural canyon, and to build the earthen dam across the end. All the dirt work was subcontracted to John F. Blakemore of Monrovia, Calif.



Backfill around structures was compacted by a Gunderson-Taylor Triplex tamper.

Blakemore's selection of equipment was governed principally by the medium hauls and extremely steep grades which would be a constant characteristic of the work. He brought in 4 Tournamatic Tournapulls for the tough digging job. They were light in weight, yet had the power and stamina to take the steep grades in stride. Moreover, the four units would not be likely to bunch up or get in each other's way in the small congested work area.

Along with the Tournapulls, Blakemore brought in five D8's to handle pusher work, dozing, pioneer road building, cut pioneering, and roller work. Two special sheepsfoot rollers, built by Southwest Welding & Mfg. Co. two years ago for a high-compaction job at Baldwin Hills, were employed. Water equipment consisted of three trucks and tanks: 3,000; 2,500; and 1,500 gallons in capacity.

It was apparent from the start that extraordinary digging methods would have to be used, and some contractors who bid the job expected to use explosives to loosen the tough but disintegrated granite formation. Blakemore decided to work rippers to the limit of their endurance before he went to explosives, so he brought in a pair of K30 LeTourneau Rooters, and several ripper teeth which fasten to a dozer blade. These were so powerful that they broke even the most stubborn granite, so that it could be loaded out by the Tournapulls.

Abrasion on the ripper teeth and cutting edges of the scrapers was reduced by hard-facing these exposed surfaces with Rexarc welding rod, applied by the arc process.

To meet compaction requirements, the soil was spread out in 6-inch lifts, the necessary water to bring the moisture content to Proctor optimum was added, and the lifts were then compacted by one of the sheepsfoot rollers. These rollers were fortunately heavy enough to develop density on open lifts without question. In the confined places around the inlet and outlet towers it was another matter entirely, because conventional tamping equipment designed for small areas seemed unable to develop the required high density at a satisfactory rate of speed.

This problem was solved by an outlay of equipment and the selection of the best clayey soil for close-in backfill. Specially selected soil was hauled in to a mixing storage area, where moisture was added and the material was mixed and blended by a Seaman Pulvi-Mixer. The intimate blending of soil moisture with the particles, followed by curing or conditioning for a period of a day or two, seemed to ready the soil for the most compaction possible with a given compactive effort. When the soil was Seaman-tilled in this manner, 6-inch lifts could be compacted to the required density by a Gunderson-Taylor Triplex tamper. This machine was used in those areas where a sheepsfoot roller could not go.

As the excavation moved deeper, the banks were finished off by a No. 12 Caterpillar motor grader. One of the photogenic parts of the dirt work was the mechanical sloping of the 2 to 1 reservoir face with the

(Concluded on next page)

ED WORK
PH DAM

*
THESE ARE
THE CHIEF JOSEPH
BUILDERS

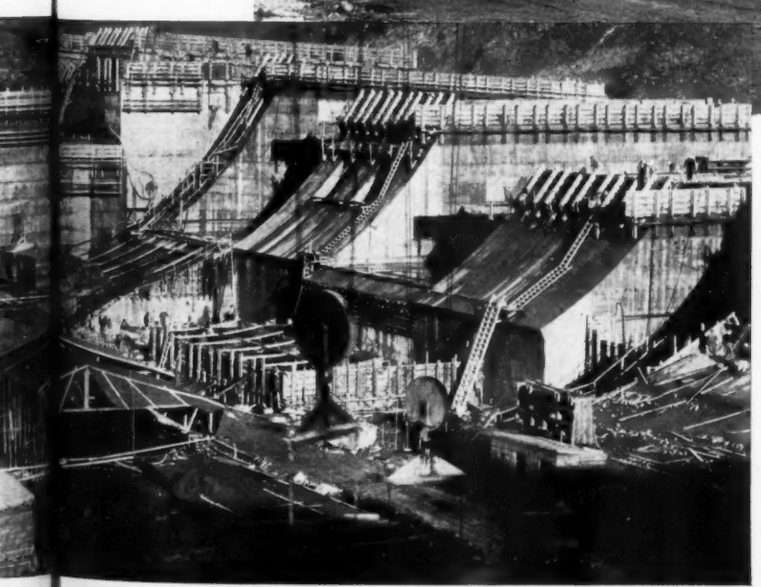
The Arundel Corporation, Baltimore, Md.

L. E. Dixon Company, San Gabriel, Calif.

The Hunkin-Conkey Construction Company, Cleveland, Ohio

American Pipe & Construction Company, Los Angeles, Calif.

THIS IS only a tiny part of the vast quantity of equipment used on the Chief Joseph Dam project. All of it is lubricated exclusively with Texaco.



CHIEF JOSEPH DAM at Bridgeport, Washington, is just below Grand Coulee Dam on the Columbia River. When completed it will have a power generating capacity second only to Grand Coulee itself. The dam takes its name from the famous Chief Joseph of the Nez Percé Indians. Picture shows cableway placing in stilling basin.

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Pave Steep Slopes For Water Reservoir

(*Continued from preceding page*)

No. 12 grader, working longitudinally with the slope. The motor grader was held in position from tipping over by a 2-part line, reeved through a fairlead onto the drum of a Hyster side winch on a Caterpillar D8 tractor.

High Concrete Towers Built

At the same time when bedrock was exposed about 30 feet below natural ground under the west-side dam, construction of the inlet and outlet towers also began in the reservoir proper. The outlet tower especially is a tall structure, over 90 feet high. The round towers called for especially strong, careful formwork, good placing control, and excellent carpenter work.

Circular forms for the 16-foot average lifts were made up in a central carpenter yard in small easily assembled panels. A tower lift was made by erecting the inner form, after which a steel crew from Blue Diamond Corp. set the reinforcing steel under a subcontract. The outer wall was then set, and form bolts made fast. Concrete was truck-mixed from the project batch plant, and was transferred to the pours by a Link-Belt Speeder truck crane, whose boom was sufficiently long to hoist a 1-yard concrete bucket 90 feet.

The walls varied in thickness from 8 inches at the top to 24 inches at the bottom. Excellent stripped surfaces were produced by vibrating the concrete with Maginniss high-cycle vibrators, which moved mortar out to the surface, reduced air bubbles to a minimum, and eliminated the segregation of the concrete aggregates.

Long Steep Slope Paved

A 3-inch compacted asphaltic-concrete lining was placed inside the reservoir, calling for the placement of this material on a 2 to 1 slope 131 feet long. Schroeder Paving Co. had the subcontract for this item and moved along rapidly.

It was obviously out of the question to attempt the use of conventional self-powered paving equipment on such a long steep slope, so Schroeder Paving Co. built special equipment to handle the hot-mix and develop its compaction. The spreader consisted of a shop-built box holding approximately 2 cubic yards, mounted on rubber tires and controlled from the reservoir crest by a single-part cable. The cable was anchored to the drum of a Hyster side boom, mounted on a D4 Caterpillar tractor. On the rear end of the tractor a shop-built hopper was fastened, which held half a truckload of material. A Wisconsin-driven conveyor belt leading from this hopper loaded the spreader when the operator pulled it up the top of the slope.

Two rakers working with this outfit kept the asphaltic concrete spread evenly. The hot-mix was made in the Roscoe plant of Schroeder Paving Co., and the loads were covered during the long haul to Eagle Rock—a distance of about 15 miles.

There were two rollers. One, a 1,000-pound steel wheel, was pulled up and down the slope by a Tulsa winch mounted on a small Chevrolet flat-bed truck. The other, a 3-ton steel wheel, was pulled and slacked by the Hyster side-boom winch on a Caterpillar D4 tractor. Both tractors were rented for the purpose from J. E. Young, a pipeline contractor.

Excellent paving progress was made. It was not at all unusual to see 100 linear feet of the 131-foot slope paved in a single 8-hour shift. What could have been a dismally slow part of the reservoir construction went forward speedily and safely.

Personnel

Eagle Rock Reservoir was designed under the general supervision of Burton S. Grant, Chief Engineer of the Department of Water & Power of the city of Los Angeles. Charles J. Itter was in direct charge of design. Max K. Socha was Distribution Engineer, and field engineering was under the supervision of R. R. Proctor, Loren H. Taber, and C. A. Hayward.

Kemper's operations were directed by Bruce Kemper, with Fred Swanson in charge of concrete work, W. T. Hodges in charge of tunnels, and John F. Blakemore in charge of excavation and fill. The reservoir will long be a monument to the skill of both the engineers and contractors who participated in the project.

Portable Crushing Plant

A folder on a portable crushing plant is available from the Flaherty Equipment Co., Pocatello, Idaho. On the Model HK plant the crushers are on top of the main chassis frame. This dual crusher unit consists of a 2-deck 36-inch scalping screen, two 40 x 20 roll crushers, a 3 x 8-foot screen beneath each crusher, and an under-plant conveyor under the screens to receive the finished product.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 136.

Eimcos moving earth for fill to build major link in Pan American highway in South America.

MOVING MATERIAL *Fast*

Building levees, highways, for bulldozing, clearing boulders from highways — any job that requires low cost earth or rock moving is best done with Eimcos.

These rugged, heavy-duty loading machines are finding their place in state highway departments, county and municipal road jobs, in sand and gravel pits, in steel mills and among contractors on heavy construction and airport jobs.

Investigate the cost of handling material the Eimco way before you buy.

Above: As a bulldozer. Below: Road building job in Austrian Alps. The shape of the Eimco bucket and the rocker-arm digging action make it possible to pick up and move pieces much larger than with other equipment.

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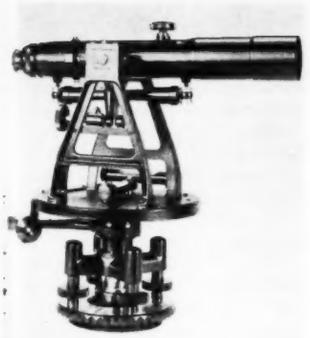

New Transit Announced

A new transit is used for establishing the horizontal and vertical planes necessary in locating and setting up jigs for sectional assembly. The Gurley Optoplane permits jig alignment and coordination within tolerances of thousandths of an inch. The new instrument does not have a vertical circle or horizontal limb, since angles are not required in jig assembly. The telescope is 11½ inches long and magnifies 22 times.

For further information write to W. & L. E. Gurley, Troy, N. Y., or use the Request Card at page 18. Circle No. 62.

Fence-Painting Kit

A bulletin describing a fence-painting kit is issued by Fence-PainteR Corp., Dept. 88, 2314 W. Van Buren St., Chicago 12, Ill. The kit consists of an applicator and handle, guard, bracket, and handle bolts. There is also an enamel receptacle, an excessor with retraction springs, and a front splash plate. An enamel mixer is included in some kits.

The bulletin gives directions for painting a wire fence and shows work done on corrugated metal and a steel tank. The company's line of enamel is also described.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 59.

dart

Vibrators are Dependable

Dart GM 240-D Electric

Every Dart unit is precision engineered and built to heavy duty service specifications. Dart offers both gasoline and electric models —a size for every concrete vibrating job.

Dart's new GM 240-D Vibrator motor features double bearing suspension, pre-spun armature winding and electronically balanced armature for smooth running and long life. Protected against low voltage damage, too.

See your Dart dealer or write now for complete literature

Dart Mfg. & Sales Co.
1246 Champa Street
Denver

Timken Expands Ohio Plant

A multimillion-dollar expansion program is under way at the Bucyrus, Ohio, plant of Timken Roller Bearing Co., Canton, Ohio.

Wigton-Abbott Corp., Plainfield, N. J., is in charge of constructing the $1,250,000 project. A new office building, boiler plant, cafeteria, locker room, and tool room are all part of the program.

New machinery and production equipment for the manufacture of the five production lines of bearing parts will be installed, and full production is expected by the end of 1954. Grinding, honing, inspection, and assembling equipment will be installed soon. Cost of this new equipment is approximately $2,000,000.

Accidents don't happen; they are caused. Remember: safety always pays.

In spite of seepage, D'Aquila Construction Co., Brooklyn, N. Y., has finished the foundation for New York's South Shore destructor plant. As the incinerator is located in the high-water table area near Idlewild Airport, L. I., N. Y., a Griffin wellpoint system, powered by three International UD-6 diesels, was installed before work was started.

CHECK THESE IMPORTANT ADVANTAGES OF
McConnaughay Asphalt Emulsions
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Above—Open-Graded Road Mix, Specification No. 3 . . . Indiana-State Highway; inset—Sand-Mix, Specification No. 8 . . . Guatemala, C.A.

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Water and weather are of less concern on road-mix jobs when you use McConnaughay Emulsified Asphalts. Here's why:

These superior emulsions *may be mixed with either wet or dry aggregates*, but give even better results when no water is added. They are little affected by water or rain during construction or after the paving is completed . . . not susceptible to drainage after mixing . . . have excellent adhesive qualities . . . assure quick compactibility after application. These features mean quicker, easier, better paving.

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

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McConnaughay Licensees (a group of long-experienced contractors, material producers, highway engineers, and manufacturers of equipment) have established enviable reputations for producing the *best* emulsified asphalt for each type of construction. Fully equipped to take on complete contracts or provide laboratory facilities, emulsions, and technical services required . . . they work with you closely in solving your problems. *Take advantage of this exceptional service.* If you are figuring on road, street, or general paving, get in touch with your nearest McConnaughay Licensee (list at left) or contact . . .

K. E. McCONNAUGHAY
EMULSIFIED ASPHALT
Plants and Processes
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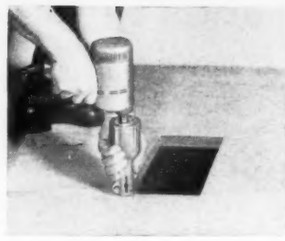
Saw Attaches to Drill

A new power saw which attaches to an electric or air drill is announced by the Acro Tool & Die Works, 4554 Broadway, Chicago 40, Ill. The saw blade is inserted in its holder which is in turn attached to the drill spindle or to the drill chuck. The saw has a wobble-shaft arrangement that converts the rotary action of the drill to a fast reciprocating motion. It cuts with a 7/8-inch stroke.



Saw blades with specially arranged teeth are available for cutting stainless steel, monel, and other metals, as well as wood and plastic. The operator can guide the saw to cut curves or angles. The saw cuts directly into wood without a drilled starting hole, while power-filing can be done by inserting a file in place of the saw blade. The entire unit weighs less than 4 pounds.

For further information write to the company and request bulletin No. 77, or use the Request Card at page 18. Circle No. 30.

Concrete Form Panels

Panels for concrete form work that have a core of plywood and faces of specially-tempered Presdwood are made by the Masonite Corp., 111 W. Washington St., Chicago, Ill. Presdply combines the surface characteristics of Presdwood with the structural qualities of thicker plywoods. It comes in thicknesses of 5/8 and 3/4 inch, in 4 x 8-foot panels.

The boards may be re-used a number of times.

For further information write to the company, or use the Request Card which is bound in at page 18. Circle No. 121.

Air-Driven Vibrators

A new catalog on air-driven vibrators for dislodging material in trucks, bins, hoppers, railroad cars, structural forms, and concrete-block machines is issued by The Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland 13, Ohio.

The booklet shows typical uses in concrete work. Included is an engineering data sheet, on which the user can indicate details of his particular problem to receive free engineering recommendations.

To obtain this literature write to the company and request Catalog No. 106, or use the Request Card at page 18. Circle No. 84.

Colorado Fuel Names Ridge

William Ridge is the new Works Manager in charge of the manufacturing operations of the Trenton and Roebling, N. J., plants of John Roebling's Sons Corp., a wholly owned subsidiary of the Colorado Fuel & Iron Corp., New York, N. Y. Mr. Ridge formerly directed operations of the company's Electric Wire Division. In his new post he succeeds J. D. Thompson, who has resigned.

Since Colorado Fuel & Iron Corp. purchased Roebling, it has added new and important products to its line. These include cold-rolled-steel specialties, a line of electrical wire and cable, bridge construction products and services, new types of wire rope, strand, cords, and assemblies, and new types of wire designed for special purposes.

New CAT* 66 HP Shovel has a bucket 8 feet wide

This is the new Caterpillar No. 6 Shovel. A glutton for work on construction jobs, it excavates, stockpiles, strips, loads, 'dozes, backfills and handles cleaning, grading and landscaping chores. Here, take a close look:

The shovel frame and tractor are welded and bolted together. This is *one* unit – big, tough and completely Caterpillar built.

That bucket is 96 in. across, scoops up 2 cu. yd. easily, and has 66 HP behind its hard-faced cutting edge of high-carbon steel. There's a 35° automatic tip-back which holds the load in the bucket, and a 50° dump angle, with impact shaking, to get rid of even the stickiest material quickly and cleanly.

The bucket is wider than the widest part of the tractor. You can work close to walls, and cut sidewalls clean, with this shovel.

Those crawler tracks are extra long and designed especially for this unit. They're non-oscillating, too, for added stability and finer grading.

The Caterpillar-built hydraulic system lets the operator raise and dump at the same time and features an automatic kick-out. And the operator sits high and clear, with excellent visibility of the bucket's sides, back and corners. Yet the unit's over-all height (6 ft. 11 in.) is low enough for working in tight places and low overhead areas.

Your Caterpillar Dealer is anxious to demonstrate the No. 6 Shovel for you. Give him a call.

Caterpillar Tractor Co., Peoria, Illinois

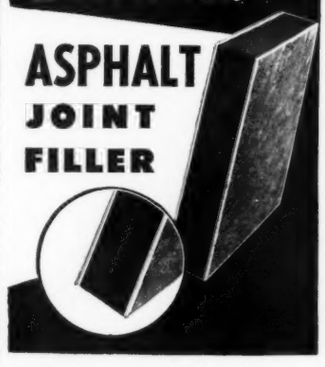
CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Servicised

ASPHALT JOINT FILLER



- Forms easily compressible cushion
- Highly waterproof
- Low in cost

Made in 5 thicknesses – 1/4", 3/8", 1/2", 3/4" and 1" – in any length or width to meet job specifications. Formed between two sheets of heavy asphalt saturated felt paper, which increases strength and rigidity and improves handling.

Write for the complete Servicised Catalog. Describes the full line of Asphalt, Cork, and Rubber Composition Products.

SERVICISED PRODUCTS CORP.
6051 W. 65th ST. • CHICAGO, ILL.

Channel Control for Missouri River

Missouri River meanderings in the spring, causing extensive damage to farms, factories, and homes in various sections of Nebraska, are expected to be curtailed when the Cunningham-Kiewit Co. of Omaha finish their channel-control contract for the U. S. Army Corps of Engineers by July 4.

Working on three separate contracts spanning 54 miles and calling for the control of 13,000 feet of river channel, the area is charted to determine where and how much control is needed. After the survey is made, a barge-mounted pile driver places piling timbers ranging from 42 to 72 feet in length to a penetration of 20 to 30 feet. Three pilings are usually tied together in a clump and placed 20 to 32 feet apart, the distance depending on whether a 1, 2, or 3-row dike is needed. Then an International TD-14A crawler tractor is placed on a rock-loaded barge. As the barge moves along the piling line, the crawler pushes off rock at the rate of 5 to 15 tons per running foot with water depth regulating the tonnage.

Approximately 120,000 tons of rock is expected to be used on the three contracts.

Loosens Frozen Parts

A chemical solvent for loosening frozen parts is made by Kano Laboratories, 1000 S. Thompson Lane, Nashville 11, Tenn. It is said to dissolve gum, rust, and corrosion and to supply lubrication. A hand-sized squirt can for dispensing the solvent is made by the company.

The chemical is recommended for reconditioning road-building equipment and for uses such as cleaning concrete-mixing tools.

For further information write to the company, or use the Request Card at page 18. Circle No. 122.

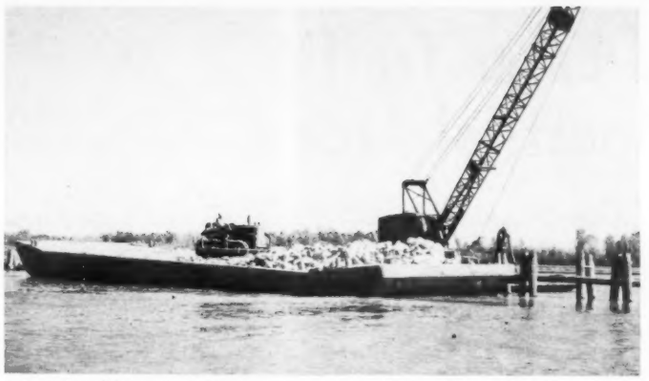
Bulletin on Pipe Couplers

Literature is available on a coupler that joins pipe without the need to thread it. The Quik-Joint coupler is said to seal without the use of joint-sealing compounds.

The booklet shows how the coupler is connected and lists a number of uses for it. Among these are the replacing of old-style unions, repairing line leaks, and joining misaligned pipe. Dimensions and other specifications are given.

To obtain this literature write to the Quik-Joint Coupling Div., Automatic Bending Co., 469 E. 159th St., Harvey, Ill., or use the Request Card at page 18. Circle No. 66.

"Jake pays him in trade—and the more he pays him the bigger the advertising space he gets."



A barge-based International TD-14A pushes rock around the pilings on the Missouri River channel control project.

McGraw Is Tops in Safety

The constructor of the billion-dollar atomic energy plant at Paducah, Ky., has established a national safety record for 1952, according to reports from the National Safety Council. F. H. McGraw & Co., New York, N. Y., was congratulated by H. H. Warzyn, Senior Engineer for the Construction Department of the National Safety Council. Mr. Warzyn said in a talk delivered at the presentation of awards that McGraw & Co. was five times better in the matter of safety than other member firms of the National Safety Council.

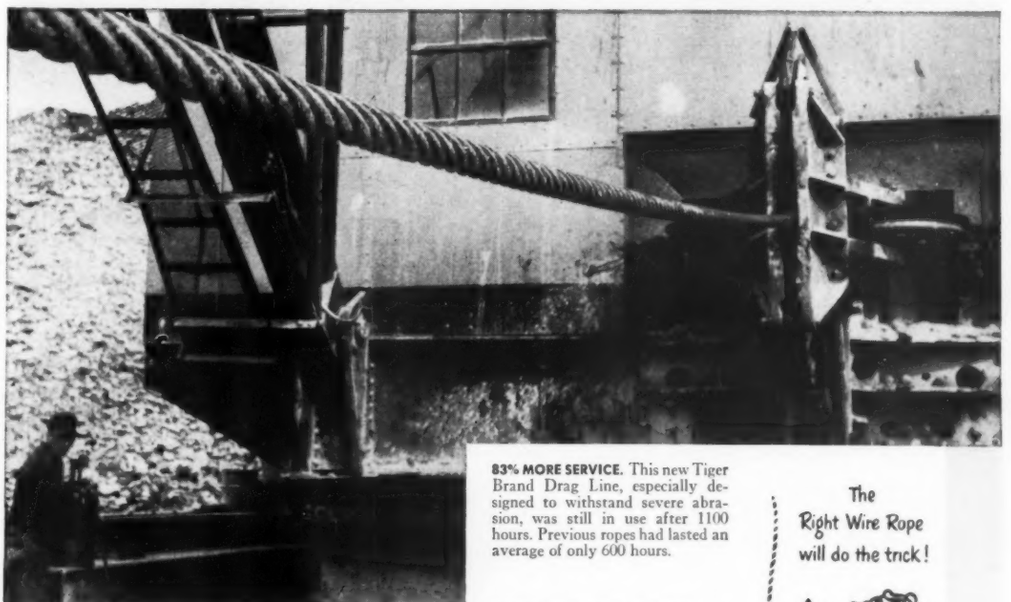
Bulletin on Earth Drill

A bulletin on a portable earth drill is available from the Buda Co., 154th St. and Commercial Ave., Harvey, Ill. The Model Y-1 drills holes from 6 to 36 inches in diameter and up to 12 feet in depth.

The literature describes the use of the drill and the adjustments that can be made for drilling at various angles. A 3,000-pound winch and a pole-setter are optional equipment.

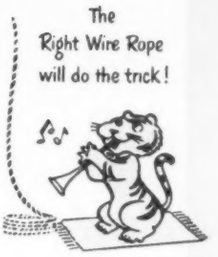
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 96.

Look at these amazing Tiger Brand records!



83% MORE SERVICE. This new Tiger Brand Drag Line, especially designed to withstand severe abrasion, was still in use after 1100 hours. Previous ropes had lasted an average of only 600 hours.

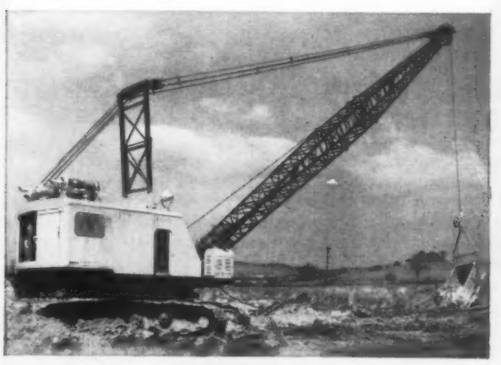
2 TO 3 TIMES MORE SUPPORT from these Tiger Brand Boom Supports. Interwoven ends distribute vibration over a long section of the rope instead of letting it concentrate at one point. As a result, these ropes last longer and cut boom support costs as much as 50%.



• Tiger Brand Wire Ropes are designed for the particular type of job on which they are intended to work. They have the needed balance of strength, toughness, flexibility and wear resistance. The quality is carefully controlled, from the iron mines to the finished product, and by our *own* engineers. Rigid tests and inspections at every step of the way guarantee a rope that matches the design specifications.

In addition, we maintain a staff of experienced Wire Rope Engineers to advise customers the correct rope to use, so that they get the best rope for every job.

Consult these men the next time *you* need rope. They can help you get longer service and cut rope costs.



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U·S·S AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

USS

UNITED STATES STEEL

Road Eases Traffic In Industrial Area

New Reinforced-Concrete Divided Highway South of Hartford Speeds Travel to Connecticut's Coastal Cities

• ONE of Connecticut's major highway projects opened to traffic late in 1952 was the 3½-mile controlled-access expressway between East Hartford and the New London Turnpike near Glastonbury. The remaining 2 miles of the project, from the New London Turnpike to Main St., South Glastonbury, will be completed this year.

The 4-lane reinforced-concrete route is on a new location except for a short stretch where it ties in to Route 17 just south of East Hartford. The thriving industrial center along the east bank of the Connecticut River had been drawing more and more vehicles to the area than ever before. In addition, the old route from Connecticut's capital, Hartford, to coastal New London carried travelers along a narrow 2-lane road through residential Glastonbury.

New Route

The Highway Department picked a new route east of Route 17 that would by-pass Glastonbury and provide stop-free and safe driving to the Turnpike. It is also planned that eventually the route will connect with a new Connecticut River bridge and completely by-pass industrial East Hartford.

This plan required widening and repaving of a considerable stretch of East Hartford's Main Street, the northern terminus. Also, a one-track railroad line was relocated to the median strip along the widened Main Street.

The 8-inch-thick reinforced-concrete lanes are 24 feet wide and are separated by a planting strip of variable width. Outside shoulders are 8 feet wide and inside shoulders 2 feet wide. Both are composed of 3 inches of gravel road-mix on top of 5 inches of compacted gravel. In cuts the slopes are 2 to 1 and in fills they vary with the height of the embankment. Sight distances, grades, and curves conform to the most modern standards of design.

The Contract

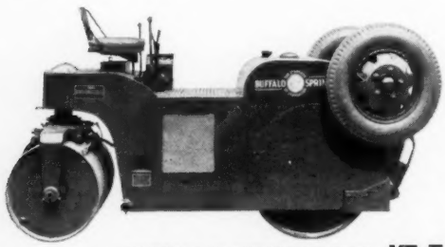
The $1,400,000 grading and paving contract was awarded to D. V. Frione of New Haven, Conn. A separate contract was also awarded to Frione for bridge work. Clearing and grubbing started in the fall of 1951, with 750 calendar days allowed for completion. Most of the work was done with bulldozers and Disston hand chain saws.

Grading

Because of the number of overpasses and also the character of the route, grading consisted primarily of placing borrow. Total excavation on the job was only 150,000 cubic yards, and most of this was in a few hills at the northern end. All cuts were worked down with three Wooldridge Terra-Cobra scrapers.

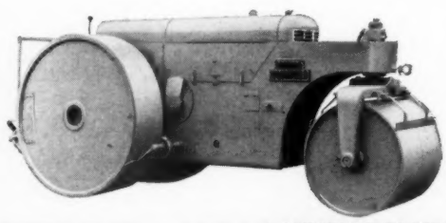
Borrow totaled over 1,100,000 yards. All but 100,000 yards came from a pit with a 2-mile average haul. Fortunately, most of the heavy fills were in the area closest to this pit. An existing road running generally parallel to the new route made an excellent haul road from the big pit. Short haul roads for getting from the existing road to the new location were leased from farmers along the right-of-way.

At the south end of the job the fills were not as heavy, but they were spread out. A pit in this area



BUFFALO-SPRINGFIELD KT-7

World's most useful 3-5 ton portable roller! Ruggedly built, with guide and drive rolls of heavy steel plate. Compact 4-cylinder engine delivers 24.2 horsepower through a simple, troublefree two-speed transmission and famous Buffalo-Springfield bevel gear final drive. Easily rigged for towing, has built-in hydraulic jack to raise drive roll. Ideal for driveways, parking lots, road and street maintenance. Ask for Bulletin S-58-49.



BUFFALO-SPRINGFIELD 3-WHEEL ROLLER

Heavy-duty engineered for continuous service on toughest jobs. Features that give you wide job versatility . . . Exclusive 4-speed transmission to provide a *continuous* range of roller speeds from 1.1 to 5.0 mph, *all at full engine power*. Machine-finished ballast-type rolls. High-speed, low-torque clutches for even, smooth reversing. Many more. Models for weights from 5 to 17 tons. Ask for Bulletin S-60-50.

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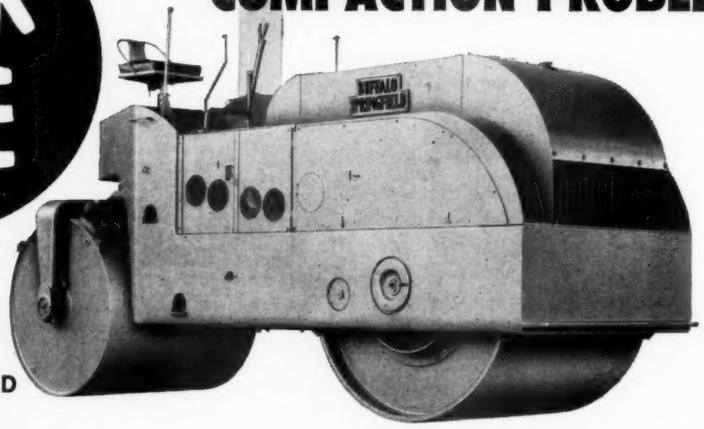
FOR THE ANSWER TO YOUR COMPACTION PROBLEM



BUFFALO-SPRINGFIELD C-MODEL TANDEMS

Feature engineering advancements offered by no other 2-axle tandems. New open grill allows operator to see drive roll from normal seated position, makes it easy to work close to curbs and shoulders. More ground-to-frame clearance than ever—increased to 17″ on 5 to 9 ton tandems, 20″ on 10 to 16 ton tandems. Rolls close to high curbs, forms and other obstructions. Exclusive 4-speed transmission provides full governed horsepower at all speeds from 1.1 to 5.0 mph. Heavy armored housing protects transmission and famous Buffalo-Springfield bevel gear final drive. These and many more profit-potential features make the C-Models your best buy in 2-axle tandems. Ask for Bulletin S-61-53.

There's a Buffalo-Springfield Distributor Conveniently Located to Serve You

Ask your distributor for complete description and specifications for model meeting your requirements—or write to us

BUFFALO-SPRINGFIELD ROLLER COMPANY

BUFFALO SPRINGFIELD — THE STANDARD OF COMPARISON

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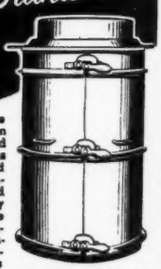
THE "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers

QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1645-113T BOONE IA

supplied over 100,000 yards at a 1-mile-average haul. Excellent production records were turned out in this area because of the unique haul setup. No parallel road existed in this area, and the State called for a service road to be built for local residents. The contractor roughed out this road with material from the pit and then sent his fast-moving Euclids out over it to the fills. This setup provided a continuous merry-go-round type of haul which could conform to any length fill. After all the fill was in, the service road was surfaced with gravel and left for local use.

Borrow Excavation

Practically all excavation in the pits was done with three 80-D Northwest's with 2½-yard buckets and one Model 6 Northwest with a 1½-yard bucket. Eleven bottom-dump and nine rear-dump Euclids did the hauling. Each shovel usually averaged 2,500 yards a day with the total average about 8,000 yards for a 9-hour day.

Fill was spread in 6-inch lifts and was compacted by the moving equipment. The silty sand was easily compacted after wetting. Three 3,000-gallon and two 1,500-gallon water wagons were used. Bulldozer work was done with four Caterpillar D8's, two Allis-Chalmers HD-19's, and four International TD-18's. Shaping required two Caterpillar No. 12 graders and one Austin-Western grader.

Selected-gravel subbase totaled 125,000 yards and was hauled from a local pit 7 miles from the job. A 1½-yard Marion worked with 10 Mack and 2 International trucks. Two 14-ton Buffalo-Springfield rollers and one 10-ton Galion roller did the compacting.

Grading continued through the winter and wound up in July, 1952. Paving began in the middle of May and finished last fall.

Concrete Paving

The contractor brought in about 10,000 feet of Blaw-Knox steel forms so that he could always keep 2,000 feet ahead of the paver. He used 10 men to set forms and one to oil. The base was covered with dirt to prevent the concrete from sticking. Forms were tamped by hand.

After forms were set, a Buckeye Finegrader followed through to take out any excess material. A scratch board checked the grade, and then a 5-ton Fordson did the final rolling.

Expansion joints were placed every 100 feet and dummy joints every 25 feet. The ¾-inch felt expansion joint had 1½-inch dowel beams every 15 inches running through the felt and into the slab on each side. One end of the I-shaped beam was fitted with an expansion plug. The joint assembly was held up by ¾-inch channels at the end of each dowel beam. A 10-gage metal shield covered the top of the felt during pouring.

Batch Plant

Cement was brought in on a rail-

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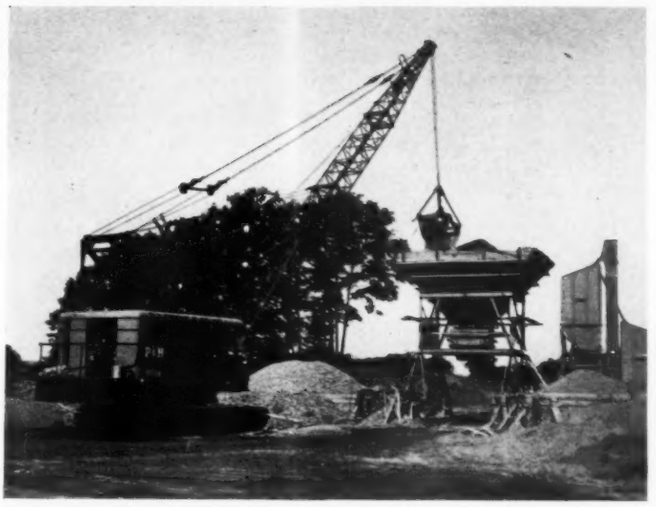

A P&H crane with 80-foot boom charges this Blaw-Knox batch plant. Contractor was D. V. Frione, New Haven, Conn. *C. & B. Photo*

Mighty Generator with 4.8 H.P. gas engine providing 2000 watts of electrical power.

PIONEER GENERATORS
where and when you need
PORTABLE POWER!

Pioneer Generators with gasoline engines give *quick*, portable power and light for your every day needs. Experience of 20 years in building outstanding generators prove that PIONEER Generators are properly engineered, and *ruggedly constructed*. Priced *economically*. **Write today** for illustrated catalogs and prices on 500 to 5000 watt PIONEER Generators. They can save you time, work and money!

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Famous for Their Saving Ways

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EXTRA POWER! How can extra power save you money? The high-compression power (7.1 to 1 ratio) of Chevrolet's Loadmaster engines in heavy-duty trucks means extra power and extra miles from each gallon of gas. Chevrolet's Thriftmaster engine in light- and medium-duty models has long been known for economy of operation.

EXTRA STAMINA! Heavier, stronger construction throughout, more rigid frames! Now, Chevrolet trucks are sturdier and tougher than they have ever been in the past—better able to handle the roughest jobs day after day, months on end. Such outstanding stamina is one more factor—and an important one—in reducing your hauling costs.

MATCHED TO THE JOB, TOO! Every Chevrolet truck is carefully engineered and *factory-matched* to the job it will do. You don't buy too big a truck. You don't buy too small a truck. You get a truck with every unit matched and balanced to the work it will do—and that saves you money, too.

EXTRA OVER-ALL ECONOMY! Many things contribute to lower hauling costs with Chevrolet. But, few are as welcome news to buyers as the fact that Chevrolet trucks list for less than any other truck of comparable size and capacity. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTI-PANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET
first in demand
in value
in sales

Road Eases Traffic In Industrial Area

(Continued from preceding page)

road siding about 10 miles away in Hartford. A Johnson 1-car storage silo with elevator was kept at the siding. On the job site, a 2-car storage silo kept the Blaw-Knox bulk plant supplied. Two 10-wheel Mack trucks hauled between the siding and the job. Usually, three cars were unloaded every day.

Stone and sand were hauled from a Hartford quarry about 9 miles away. A 3-compartment Blaw-Knox aggregate bin held ¾ and 2-inch traprock and sand. A P&H crane with 80-foot boom and 2½-yard clam stayed in one position and kept all three compartments filled. The plant was set up so that the batch trucks could be completely loaded without backing up. The merry-go-round system also simplified traffic control. Eight 3-batch Mack trucks made the haul to the paver.

A Rex 34-E dual-drum paver mixed concrete for the 4-lane divided-highway project near Hartford, Conn. *C. & E. Photo*

Cement was air-entrained with approximately 8 ounces of Darex per batch, added automatically at the paver. Composition of a typical 1.37-yard batch was:

Cement	773 pounds
Stone, 2-inch	1,630 pounds
Stone, ¾-inch	1,335 pounds
Sand	1,430 pounds
Water	37 gallons

Paving

Concrete was mixed in a Rex 34-E dual-drum paver working outside the forms. Because the paver operator is on the right side of the machine, the two outside lanes were poured first. This eliminated the necessity of riding the paver on the outside concrete lane while pouring the inside. Water was supplied by two 2,000-gallon tank trucks loaded from nearby brooks with a 4-inch pump.

Following right behind the paver were a Blaw-Knox spreader, a Jaeger-Lakewood transverse finisher, and then a Koehring longitudinal screeding machine. Hand-finishing kept close to the finishers. The final surfacing was made with a burlap drag. Sisalkraft curing paper was then put on and left there for 14 days. Forms were stripped the following day by four men and loaded on a flat truck.

Concrete totaled over 42,000 cubic yards. Production usually averaged 500 cubic yards a day for a 9-hour day. The best day was 800 cubic yards or 2,700 linear feet.

Shoulders

Shoulder work consisted of first spreading and compacting 5 inches of selected gravel. Three inches more of gravel was added to this and covered with ¾ gallon per square yard of tar. This top layer was then thoroughly mixed with a Seaman Pulvi-Mixer making two passes. Final shaping was done with a grader and then it was compacted with a 10-ton rubber-tire roller.

Drainage work totaled 15,000 linear feet of reinforced-concrete pipe in sizes ranging from 12 to 48 inches. Over 8,000 feet of Armco metal pipe in sizes from 6 to 36 inches was also laid plus 5 reinforced-concrete box culverts.

Other equipment included five general-purpose F-6 Fords, a 1,500-gallon fuel truck, and a Lincoln grease rig. The contractor also maintained a complete service garage with stock bins, welding equipment, and facilities for all but major repairs.

The grading operations used about 80 men and paving required 135 men. A 20-man company-owned bus transported a full load of key help each day from the home city of New Haven.

Personnel

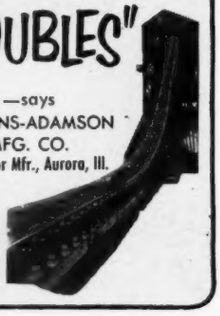
For D. V. Frione, contractor, V. J. Sullivan is General Superintendent; Robert Scussel, Project Superintendent; and John Catalani, Superintendent for bridges and concrete paving. Warren Whiton was Inspector for the Connecticut State Highway Department. The work was under the general direction of E. B. Burdick, District Engineer. The Department is headed by G. Albert Hill, Commissioner, and Warren Creamer is Chief Engineer.

Represents Galion Allsteel

R. H. Tomlinson has been appointed as regional representative for the Galion Allsteel Body Co., of Galion, Ohio. Mr. Tomlinson will direct sales and service of Galion dump bodies, hydraulic hoists, and tailgates in Kentucky, Alabama, Mississippi, Louisiana, and Arkansas.

"NO MORE LUBRICATION TROUBLES"

—says STEPHENS-ADAMSON MFG. CO.
Conveyor Mfr., Aurora, Ill.



"LUBRIPLATE Lubricants satisfy the 'one-shot' requirements of our conveyor idlers. LUBRIPLATE effectively lubricates each bearing in turn and flows through the hollow shaft to the next bearing. We do not know of a single case of bearing trouble through faulty lubrication where LUBRIPLATE has been used."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

"There's an Insley working near you"

PROJECT RATED BY THE USER—FOR THE USER
INSLEY

The Insley Manufacturing Corp. of Indianapolis has been manufacturing construction equipment since 1907. The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted—gasoline, diesel or electric powered. There's an Insley working near you.

Triple Hand Tamper

A triple hand tamper consisting of three of its backfill tampers assembled to a common head is made by Le Roi Co., 12500 Berea Road, Cleveland 11, Ohio. An air-control valve is incorporated in the head and a swivel air inlet is provided for the operator's convenience to keep the air hose away from the ground.

Long handle bars keep the operator away from the tamper to avoid injury. The manufacturer recommends the unit especially for narrow tunnel work, close foundation tamping or abutment work. The triple tamper is 40 inches high and 14 inches wide. Butt size is 5¾ inches. The unit delivers 550 blows per minute per butt.

For further information write to the company, or use the Request Card at page 18. Circle No. 51.

Data on Pipeline Trencher

A new bulletin on a pipeline trencher has just been published by the Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio. The folder contains photographs showing the Model 320 in action in all types of job and weather conditions. Text briefly outlines advantages and special features.

Complete dimensions and specifications, including a table of optional cutting widths are given.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 150.

SAMSON BAR CUTTERS

- All Steel Construction
- Unbreakable Frame
- Easy Operation
- Immediate Shipment

Write for catalog of Metal Working Equipment

CAPACITY	No. 20	No. 23	No. 26
Rounds	⅝"	¾"	⅞"
Squares	½"	⅝"	¾"
Flats	2"x¼"	2½"x5/16"	2½"x⅜"
PRICE	$46.40	$66.00	$72.00

f.o.b. New York, subject to change

JULIUS BLUM & CO., Inc.
Established 1910
538 West 22nd St., New York 11 • WAtkins 9-7042

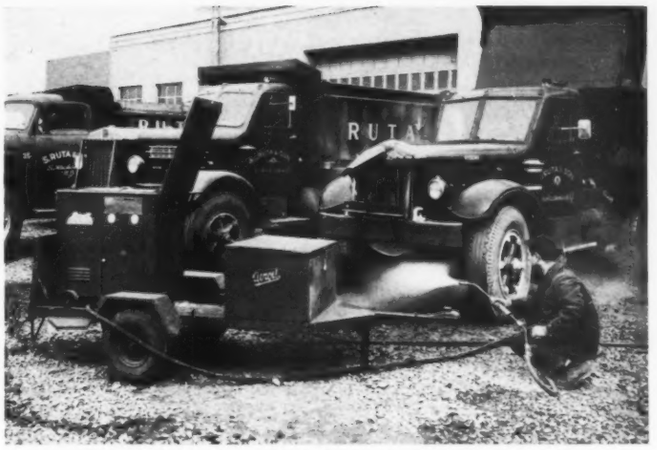
AISC Annual Conference

The American Institute of Steel Construction held its Fifth Annual National Engineering Conference last month. Representatives came to Detroit from most of the 286 AISC member companies, from the Canadian Institute of Steel Construction, and from many universities.

Scheduled events included talks on construction and design, a panel discussion on structural steel and the urban traffic problem, informal discussions of engineering problems of interest to fabricators, and the annual banquet.

The AISC conducts research in the uses of structural steel, and prepares technical papers, manuals, and specifications of interest to members of the engineering profession.

A calendar of convention dates appears on page 102 of this issue.



The Auto-Steam cleaners are made in units of 100 and 150 psi capacity, and have automatic low water cut-off, a gun shut-off control, and a hot water thermostat. They can also be provided with reverse flush attachment for flushing out radiators. For further information write the Aeroil Products Co., Inc., 75 Wesley St., South Hackensack, N. J., or use the Request Card at page 18. Circle No. 125.

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When it's time to rebuild...
These great shovels deserve the best-

Stoody Hard-Facing Alloys

TEETH, ROLLS, IDLERS, TUMBLERS, PADS, BUCKET LIPS and similar wearing parts are easily kept in tip-top running condition with STOODY HARD-FACING ALLOYS.

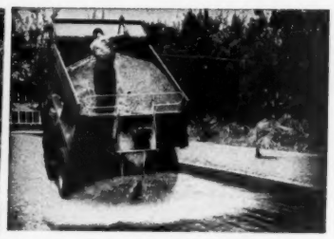
The Guidebook shows how to repair wear damage quickly—make old shovel parts do the work of new! If you operate shovels and crawlers ask for your copy today...there is no charge!

STOODY COMPANY
11934 East Slauson Avenue, Whittier, Calif.

MODEL R HI-WAY SPREADER

Here is the Spreader that *outperforms all others*, as proved by actual field tests and on-the-job figures!

Use it for any type of aggregate from fine sand to crushed stone. It will spread forward or reverse, with control of material flow. By using baffles, you can control the width of the spread from one foot to the maximum. You'll be amazed at *Model R's* record of operational economy. Available in sizes from 8' through 13'.



MODEL DD TAILGATE SPREADER

Here is the economical *all-purpose, all-weather* Spreader—used in the summer for dust control and for seal coating, and in the winter for spreading sand, cinders or rock salt on icy pavements.

Model DD fits any standard dump truck body and can be attached or detached in one minute. It gives a uniform spread 4 to 60 feet wide, at 1 to 35 miles per hour. *Model DD* will give you years of economical, trouble-free service.

Sold by leading distributors throughout the U.S., Canada and many foreign countries

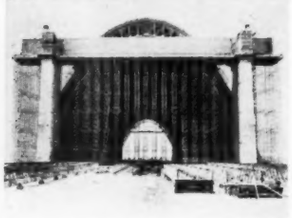
HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA, U. S. A.
MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

PLAY IT SAFE! BUILD PROFITABLY with

SAFWAY Tubular Steel Scaffolding
—first in the field!

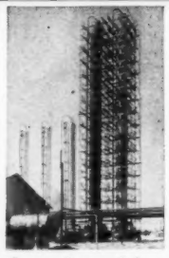
MAKING THE MOST OUT OF TUBULAR STEEL is standard Safway practice. That's why you get substantial savings in operating costs with Safway scaffolding . . . a fact well supported by experience of builders and contractors everywhere. It'll pay you to investigate the advantages of America's safest and most popular scaffolding. Write today for more facts. Or contact one of the 137 Safway dealers near you.

Towers of Webbed Steel



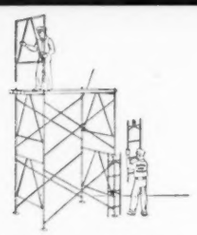
92 miles of tubular high carbon steel go into 50 towers built of Safway scaffolding. Each Safway tower supports 20 tons at the U.S. Navy hangar on the East Coast.

Reaching for the Sky



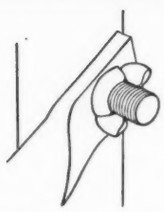
Straddling base equipment, Safway scaffolding reaches high at this Dallas, Texas oil refinery. Safe, strong Safway equipment is a favorite in fabulous Texas oil country.

When Time Is Money



Light weight Safway end frames are easily handled by one man. You need only a few basic interchangeable members to assemble scaffolds of any shape or height. Two men can easily erect 30 feet of scaffolding in 30 minutes.

Safety Builds Profits



Notice how Safway design gains its strength. Trouble-free wing nuts solidly hold carbon steel tubular cross braces to end frames; cross braces pivot on hardened steel, Hi-Shear rivets that really last.

SAFWAY STEEL PRODUCTS INCORPORATED
6240 West State St.
MILWAUKEE 13, WIS.
Manufacturers of Tubular Steel Scaffolding and Equipment

RENTED and SOLD by distributors everywhere

Portable Mixer For Paving Job

In Fixed Location for Emergency Job, 3-Cubic-Foot Patcher Fills a 4-Yard Dump Truck in 17 Minutes

A crew repairs a 3-mile section of road in Cole County, Missouri, with a McConnaughay HTD 3-cubic-foot Multi-Pug asphalt mixer. The extension on the flue keeps fumes above the truck. *Houck Photo*

• HIGH-SPEED low-cost blacktop patching which eliminates almost all conventional preparation is saving money for the Jefferson City Special Road District in Missouri. A simplified system of laying down a 3-mile emergency road-repair section brought a number of visitors from other states.

Crew and Equipment

The regular crew consists of seven men and two trucks, and although speed is in ratio to the number and size of the patches, they have patched more than 10 miles in a day. One truck is loaded with chat and tows a McConnaughay HTD Multi-Pug asphalt mixer while the other truck carries a 1,000-gallon asphalt tank. One man runs the mixer, one man loads the hopper with chat from the truck, one man handles the measured quantities of asphalt and drives the tank truck, two men shovel the mix to the patches, and two men level the patch with rakes.

The mixer is equipped with two vaporizing burners using kerosene, which heats mixes up to 300 degrees. The 3 cubic feet of mix is discharged into a pan at road level in

BOTH WORTH LOOKING INTO-

MANGANAL
11% - 13½% Manganese-Nickel Steel
THE TOUGHEST METAL KNOWN—
For Speedy and Low-Cost Replacement of Worn Equipment Parts.

YOUR MANGANAL DISTRIBUTOR
An organization of skilled craftsmen that you can depend on for sound advice, to save time and money on the repair and rebuilding of heavy equipment.

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U.S. Patents 1,876,738—1,947,167—2,021,945
11%-13½% Manganese-Nickel Steel
• APPLICATOR BARS • WEDGE BARS
• SPECIAL SHAPE APPLICATOR BARS
• HOT ROLLED PLATES • SPECIAL TITE-KOTE AND BARE WELDING ELECTRODES
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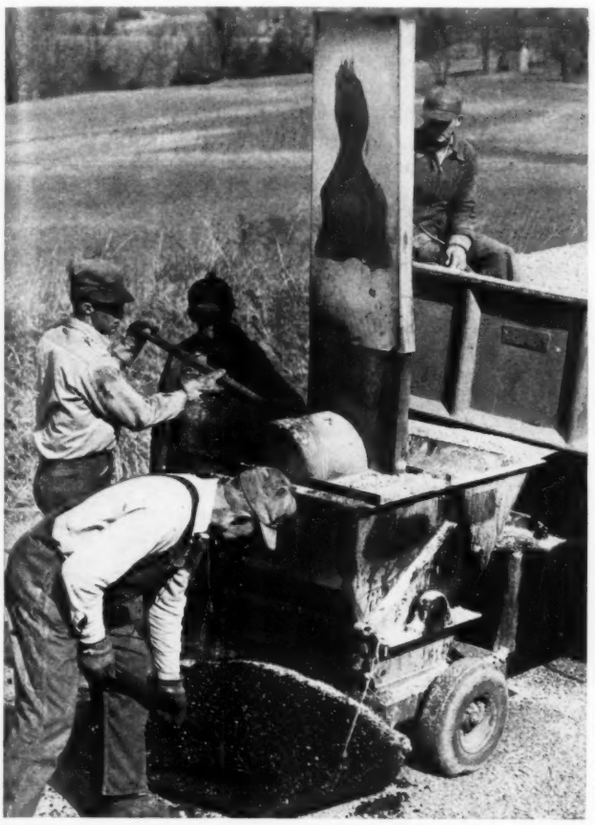
FREE WALL CHART
New edition illustrating 23 actual size WEDGE BARS with dimensions and weights, for easy reference.
WRITE TODAY!
Send for FREE helpful tips on speedy and economical repair of worn equipment.
NEAREST DISTRIBUTOR UPON REQUEST

STULZ-SICKLES CO.
SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

the rear of the machine at 1 to 3-minute intervals. Winter mixes are heated to 200 degrees and laid down in patch holes whether wet or dry. Patches placed in wet holes a year ago are still tight and show no discernible wear.

since it soaks through to the old surface before setting. Most of the summer patching is done cold.

The aggregate called chat is a local crushed-limestone product with about 15 per cent fines and maximum of about ¼-inch sizes.



One workman scoops material from a pan at the back of the Multi-Pug, while another heats his shovel blade in the mixer's burner. *Houck Photo*

The hot-mix is shoveled from the pan to the patches by hand, leveled with rakes, and compacted by traffic. Since the mix sets in 5 minutes there is no necessity for barricading, and traffic proceeds while the crew works.

The asphalt is thinned a little to provide for an automatic tack coat,

Built 3-Mile Road

While the small pugmill was bought a year ago especially for patching the district's blacktop roads, it starred in a drama of fast replacement of a damaged 3-mile section. This section had been used for a couple of pipeline crossings and

(Concluded on next page)

AMSCO
V-MANG

The new moly-manganese electrode that's better than nickel-manganese rods for build-up and repair

- **Tougher deposit**
- **Higher yield strength**
- **better weldability**
- **less cracking**

For full engineering and metallurgical information on Amsco V-Mang, write for technical data sheet to Amsco, Chicago Heights, Illinois.

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Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Army Finance Center Building, Fort Benjamin Harrison, Indianapolis, Indiana. Contractors: Sherry-Richards Co., Corbetta Const. Co., Inc., Willcox Const. Co., Inc., James McHugh Const. Co.

1400 Sets Symons Column Clamps Used on Job

Symons Column Clamps are simple in construction—only two units; both alike and no loose parts. They are completely adjustable and simple to apply—require only a hammer. Columns are squared automatically and accurately. Available in standard sizes 36, 48 and 60-inch. Also special sizes up to 84 inches.

To aid you in the erection of column forms send for your FREE copy of Symons Concrete Forming Tables. Symons Clamp & Mfg. Co., 4251-E3 Diversey Ave., Chicago 39, Illinois.

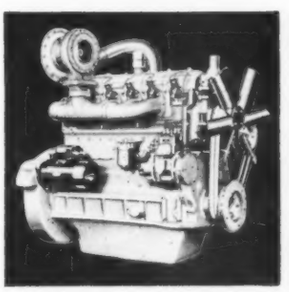
POWERFUL SMOOTH FAST

WAUKESHA
135 Series

426 and 451 cu. in.
•
147 to 185 max. hp

Diesel or Gasoline ENGINES

• Waukesha 135 Engines are ideal for almost any service in their speed and power range. Gasoline versions are 426 and 451 cubic inch displacement; Diesels are 426 cubic inch, normal or turbocharged. Counterbalanced crankshafts, aluminum pistons, full pressure oiling—every modern feature! Exceptionally rugged, smooth, and lively. For medium speed industrial service these engines are available with standard crankshafts. Send for bulletins.



135-DKBS—TURBOCHARGED DIESEL
Maximum hp 185 @ 2800 rpm.

213

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
New York • Tulsa • Los Angeles

Portable Mixer

(Continued from preceding page)

much of the rest spalled. The old blacktop was bladed off.

The small mixer was set up on an elevated loading platform so that it could discharge into dump trucks. Aggregate was fed to it by means of a chute with a hand-operated stop gate at the bottom. Its top was at the right height for loading with a Hough loader mounted on an International I-6 tractor.

The outfit was located in the yard adjacent to the district garage and only a short distance from the stockpile of chat. The operation sequence was simple. The loader kept the chute full. The mixer operator filled the hopper at will from the chute and discharged his finished batches into the waiting dump trucks, which were loaded in 15 to 20 minutes. Consistent output was rated at 4 yards each 17 minutes. More than 700 tons of blacktop was produced for the road job.

The district's fleet of three 4-yard Internationals and two 3-yard dumps —one Chevrolet and one Dodge— were kept busy hauling the mix to the job several miles away. It was dumped in place and spread with a Caterpillar No. 112 grader.

Personnel

The Jefferson City Special Road District is a part of Cole County, Mo., road system under the jurisdiction of the County Court. These are secondary roads not maintained by the State Highway Department. The special district has about 100 miles of roads, half of which are blacktop.

Floyd E. Ross is Cole County Highway Engineer and Joe Sturm is Superintendent of the Jefferson City Special Road District.

Portables Patch Main Roads

The Missouri State Highway Department also owns a number of McConnaughay mixers which are used for patchwork and crack filling, especially in the winter time. Division No. 1, St. Joseph, has several, and there is one each in Division 5, Jefferson City; Division 2, Macon; and Division 8, Springfield.

How Concrete Slip Forms Are Raised Hydraulically

Hydraulic raising of slip forms for concrete construction is described in a new booklet from B. M. Heede, Inc., 80 Broad St., New York 4, N. Y. The Concretor system uses hydraulic jacks raised by a small electric oil pump at a rate up to 20 inches per hour depending on the growing strength of the concrete and the speed of placement.

A number of standard machines for slide-casting round tanks and storage silos have been used with inner diameters ranging from 6 to 26 feet and with an interval of about 3 feet.

An electrically driven hoist on top of the form lifts the concrete in a bucket and empties it into a distributor revolving around a center pole. With a 2-man crew, one works on the ground operating the mixer and taking care of the reinforcing steel, while the other works on top hoisting concrete and steel, pouring, reinforcing, and raising the machine. Average slide-casting rate is said to be about 1 foot per hour.

For large square or rectangular concrete structures, and silos and towers of other than the standard diameters mentioned above, hydraulic jacks are used with standardized steel yokes on which the wooden form is suspended. Pit-head buildings, factories, and bridge pillars have been built this way.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 22.

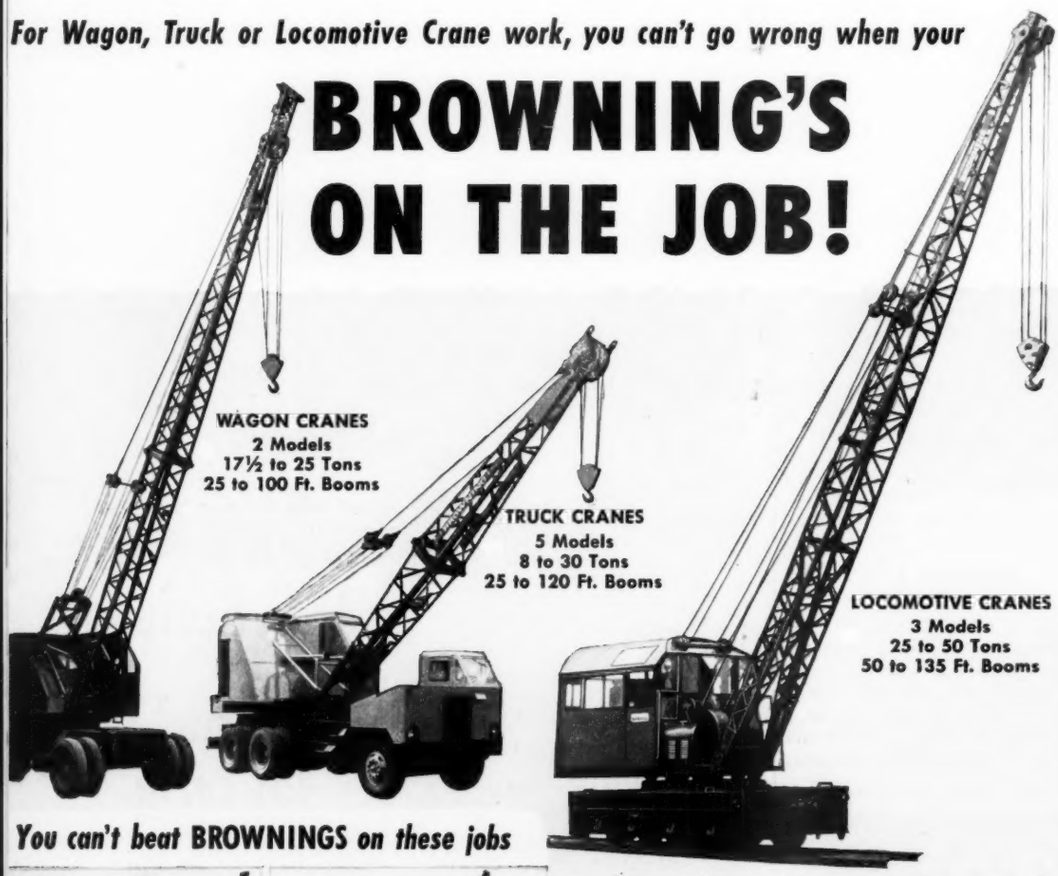
Turner Turnpike Is Opened

The opening of Oklahoma's Turner Turnpike will be celebrated on May 16 at Stroud, Okla., the turnpike's midway point. Officiating at the ceremony will be former Governor Roy J. Turner, for whom the road is being named, and Governor Johnston Murray.

The Turner Turnpike, an 88-mile superhighway toll road joining Oklahoma's two major cities, Oklahoma City and Tulsa, is the first leg of what may become an integrated system of toll roads linking the southwestern and middle-western states with the east. It is being financed by self-liquidating bonds issued in 1950, and is receiving active assistance from the former and present governors of the state.

For Wagon, Truck or Locomotive Crane work, you can't go wrong when your

BROWNING'S ON THE JOB!



You can't beat **BROWNINGS** *on these jobs*

HEAVY MATERIALS HANDLING

CAR LOADING AND SWITCHING

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RAILROAD MAINTENANCE

SAND AND GRAVEL LOADING

Browning builds the only complete line of cranes for all heavy-materials handling

TRUCK CRANES with independent control of each function *separately or simultaneously* on all models. High-speed maneuverability in worst conditions. Short wheelbase for operation in close quarters.

SELF-PROPELLED WAGON CRANES, originated by Browning. Rubber-mounted, one man operation, with the power, smoothness and versatility to operate efficiently and economically on a wide variety of crane work.

DIESEL AND TORQFLO LOCOMOTIVE CRANES with unequaled power for switching. Fast, easy controls for maximum productive operation. Rugged design and construction for year-in, year-out dependability.

BROWNING can recommend, and deliver the *right* crane model for your job. Our fifty-four years' experience as crane specialists is yours for the asking. Write us for complete information.

THE BROWNING CRANE & SHOVEL CO.
Dept. D, 16226 Waterloo Road, Cleveland 10, Ohio

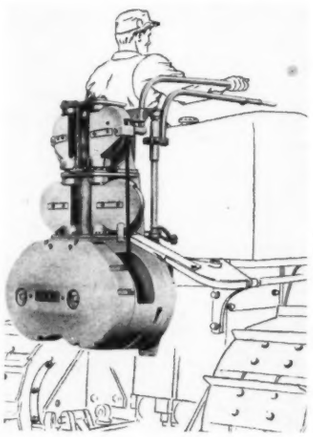
BROWNING
LOCOMOTIVE, WAGON TRUCK AND CRAWLER *Cranes*

"I'm afraid I hired you a little too fast. Offhand, do you happen to know the dimensions of a two-by-four?"

Power-Control Unit

A new rear-mounted power control unit is announced by the Baker Mfg. Co., 2573 S. 10th St., at Stanford, Springfield, Ill.

The unit is designed for use on HD-15 and HD-20 Allis-Chalmers



tractors, and on other tractors of comparable horsepower. The PCU-75 combines a multiple-disk clutch with a simplified brake system. The clutch is said to actuate within a shorter distance than other types of clutch, and can be engaged or disengaged with a lever travel of 5 inches. The brake system features single-point adjustment, with tension changes made from one adjusting bolt.

Hand levers on the unit swing horizontally, and may be adjusted by the operator for length, angular position, and height.

For further information write to the company, or use the Request Card at page 18. Circle No. 61.

Booklet on Lubricant

A lubricant said to work at high bearing pressures and temperatures is described in a booklet from the Alpha Corp., 179 Hamilton Ave., Greenwich, Conn. The front-piece explains the reasons for the adherence and low coefficient of friction of the molybdenum-disulfide compound.

Molykote comes as a dry lubricant, Type Z; a grease film, Type G; a bonding coating, M88; and as a liquid suspension, M55. Another formula is made for high temperatures found in oven chain lubrication. Physical and chemical properties and prices are listed.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 12.

Van Brush's 25th Year

A further expansion marks the silver-anniversary year of Van Brush Mfg. Co., Kansas City, Mo., manufacturer of brushes and brooms for road-building contractors. The company's general office remains at 327 Southwest Blvd., but it has acquired an additional 3,000 square feet at 321 Southwest Blvd. The new space is devoted entirely to the refilling of rotary-sweeper cores and is known as Plant No. 2—Rotary Sweeper Core Division.

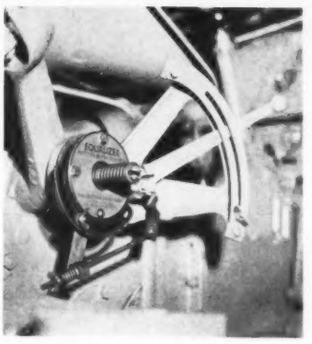
The new plant represents Van Brush's ninth location since the establishment of the company a quarter of a century ago.

Device Maintains Depth Of Tractor Attachments

A tractor accessory for holding pull-type attachments at a predetermined depth is available from the Earth Equipment Corp., 2036 Sacramento St., Los Angeles 21, Calif. The Equalizer, once set for any desired working depth, is said to prevent the attachment from bobbing up and down because of changing soil conditions.

The device is recommended for grading, leveling, scraping, or for work in uneven-textured soil. The manufacturer states that it is easy to install.

For further information write to



the company, or use the Request Card that is bound in at page 18. Circle No. 153.

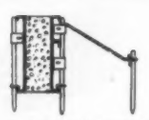
Off-the-Highway Tire

An off-the-highway tire is the subject of a folder from U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y. The Contrak-tor tire features a new offset lug said to resist sideslip even on sharp inclines. The lug has a wide bite and rounded shoulder. A flat tread is used to increase mileage.

The tire comes in rayon and nylon and is available in sizes 12.00 x 24 to 21.00 x 25. The manufacturer points out that nylon resists heat, moisture, and bruising.

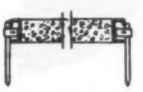
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 36.

Use BLAW-KNOX UNIVERSAL FORMS FOR FASTER, BETTER LOWER-COST WORK



Straight Curb Forms for curb with both faces vertical. Auxiliary bracing system provides lateral stability.

Curb and Gutter Forms for combination concrete curb and gutter when curb is battered.



Sidewalk Forms are available for any required width or thickness of sidewalk.

Flexible Steel Radius Forms for curved work of variable radius.

EVERY dollar ear-marked for curb and gutter work goes farther . . . and yields more profit when you use Blaw-Knox Universal Steel Forms. They give you the fastest, most economical method of forming concrete curb, curb and gutter, integral curb or sidewalks you ever saw! One set of Blaw-Knox Steel Forms can handle *every* job from simple straight work to serpentine or curved shapes, without the expensive carpentry that cuts profits. They save on costly materials, too. Easy to set and strip; they get the job finished on schedule and well within your estimate. You can use them repeatedly in combinations to fit every requirement. Costly hand finishing is greatly reduced and finished jobs have a smooth perfection impossible to achieve with wood forms. Form maintenance is practically non-existent.

Find out about the Blaw-Knox "Complete Package" of Steel Forms

Here's every type, shape and size of form you need for low-cost construction of concrete curb, curb and gutter, integral curb and sidewalk, all in one convenient "package". Start your set of Blaw-Knox Steel Forms *now* . . . add to it at any time to meet future requirements. See your Blaw-Knox distributor today for complete details, or write for Bulletin 2259.

BLAW-KNOX HEAVY-DUTY FORMS FOR ROADS AND AIRPORTS

Especially designed to meet requirements for thicker paving slab for modern airports, or carry the load of heavy modern road-building machinery, Blaw-Knox Heavy-Duty, Self-Aligning Steel Paving Forms save money on every job. The exclusive self-aligning feature alone reduces form setting costs to the minimum! Write for Bulletin 2370 or see your Blaw-Knox distributor.

BLAW-KNOX

BLAW-KNOX EQUIPMENT DIVISION
OF BLAW-KNOX CO.
Farmers Bank Building
PITTSBURGH 22, PA.
Offices in Principal Cities

BLAW-KNOX

Old Concrete Slab Is Widened and Surfaced

Plant-Mix Is Used for 3-Foot Widening on Each Side Of 18-Foot Pavement, and for Full Width 2-Course Top

• WHILE regular users on U. S. 50 east of Jefferson City, Mo., were quick to note the better driving qualities of a widened and retopped 10-mile stretch from the eastern city limits to the junction with U. S. 63, few realized that corrections in grade were mostly responsible. Many new cross sections were run and every effort was made to modernize the surface with asphaltic concrete wedges within the main specifications of the job and short of building an entirely new highway. This added much more to the value of the improved section over ordinary widening and resurfacing.

U. S. 50 runs east and west across Missouri. It is a 9-6-9-inch concrete slab 18 feet wide for most of the 13.7-mile section, with a few 20-foot-wide areas. Most of it is 25 years old although some was redone in 1930. The road was designed for light traffic and had become outmoded in spite of periodic improvements and repairs.

The Job

The job consisted of 3-foot widening on each side of the 18-foot widths, widening excavations of 12 inches, with 8 inches of AC laid in three courses (two 3-inch and one 2-inch) on top of a 4-inch rock subbase, and then a 1¾-inch course of binder across the entire surface followed with a top course of 1¼ inches of asphaltic-concrete resurfacing.

The job is a part of the Highway Department's $557,000,000 10-year road-improvement program and was let early last spring to the Granite Bituminous Paving Co., of St. Louis, for $582,133.48. The contractor sublet the aggregate production to the Menefee Construction Co., of Sedalia, Mo. Aggregate production started in March and Granite started in August.

Aggregate Production

Menefee moved his 42-S Pioneer gravel plant to the site of an old quarry east of U. S. 63 junction and about half a mile from U. S. 50. The aggregate production was hauled by dump trucks to the site of the asphalt plant and stockpiled.

The rock plant was under the supervision of C. S. Rhodes, Superintendent, whose first move was to remove the overburden from some new limestone beds with a D8 dozer. The new benches were broken up for loading with dynamite, and holes were made with two Joy-Sullivan

CLEAVER-BROOKS—DISTRIBUTORS

ALABAMA—J. D. Pittman Tractor Co., 500 N. 28th St., Birmingham 2; Burford-Toothaker Tractor Co., 2521 Halls Mill Rd., Mobile; P. O. Box 1591, Montgomery 2.
ARIZONA—Arizona Cedar Rapids Co., 1726 W. Jackson St., Phoenix.
ARKANSAS—Clark Equipment Co., Cantrell Rd. and Booker St., Little Rock.
CALIFORNIA—Casson Hale Corp., 22101 Meekland Ave., Hayward; Standard Steel Corp., 5001 Boyle Ave., Los Angeles 58.
COLORADO—H. W. Moore Equipment Co., 6th and Acoma Sts., Denver 1.
CONNECTICUT—Deephouse Equipment Co., 160-170 Farmington Ave., Berlin.
D. C., WASHINGTON 2—Hovey-King Co., 314-316 Randolph Pl., N.E.
FLORIDA—Florida-Georgia Tractor Co., Beaver and Huron Sts., Jacksonville; 3139 N. Miami Ave., Miami; P. O. Box 1511, Lakeland; Box 987, New Quincy Highway, Tallahassee; P. O. Box 2245, Tampa.
GEORGIA—W. C. Caye & Co., Inc., 787 Windsor St., S.W., Atlanta.
ILLINOIS—Hillman Equipment Co., Box 170, Bloomington; 2000 N. Hawthorne, Melrose Park; Wisner, Inc., 821 Main St., Peoria; 1319 Broadway, Rockford, 526 - 11th St., Rock Island.
IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 N. Fourth, Pocatello.
INDIANA—Reid-Holcomb Co., 1815 Kentucky Ave., Indianapolis.
IOWA—James W. Bell Co., Inc., 1720 1 Ave., N.E., Cedar Rapids; 2818 Fifth Ave., Des Moines 13.
KANSAS—The Victor L. Phillips Co., Box 1557, Wichita.
KENTUCKY—Bogle Equipment Co., 801 E. Third St., Lexington 47; 1212 S. Seventh St., Louisville.
LOUISIANA—Frank P. Fischer Engineering Co., 7924 Maple St., New Orleans 18.
MAINE—Parker-Danner Co., Riverside Drive, Augusta.
MASSACHUSETTS—Parker Danner Co., 25 Factory St., Hyde Park 36; 71 Needham St., Newton Highlands.
MICHIGAN—Eddy & Co., 2500 S. Pennsylvania Ave., Lansing 4; Straits Engineering Co., 400-2 Ashmun St., Sault Ste. Marie.
MINNESOTA—Ruffridge-Johnson Eq. Co., 250 Tenth Ave., S., Minneapolis.
MISSISSIPPI—Watkins-Aldridge Equipment Co., 912-916 S. State St., Jackson.
MISSOURI—The Victor L. Phillips Co., 16th and Baltimore Sts., Kansas City; The George F. Smith Co., 5215 Manchester Ave., St. Louis.
MONTANA—Hall-Perry Machinery Co., 304 Fratt Bldg., Billings; 802-812 E. Iron St., Butte; Coram; P. O. Box 307, Great Falls; Missoula.
NEBRASKA—Anderson Equipment Co., 200 Merchants Nat'l Bank Bldg., Omaha 8.
NEW HAMPSHIRE—Parker-Danner Co., 507 Elm St., Manchester.
NEW JERSEY—R. E. Brooks Co., Route 17, Box 17, Hasbrouck Heights.
NEW MEXICO—R. L. Harrison Co., Inc., 1801 N. Fourth St., Albuquerque.
NEW YORK—Syracuse Supply Co., 76 Wall St., Binghamton; 2080 Military Rd., Buffalo 17; R. E. Brooks Co., 50 Church St., New York; Syracuse Supply Co., Portville Road, Olean; Van's Equipment Sales, Inc., Routes 9 and 20, Rensselaer; 1349 University Ave., Rochester; Syracuse Supply Co., 294 Ainsley Drive, Syracuse.
NORTH CAROLINA—North Carolina Equipment Co., P. O. Box 5006, Asheville; P. O. Box 1205, Charlotte; P. O. Box 128, Guilford; P. O. Box 655, Wilmington; 3101 Hillsboro St., Raleigh.
NORTH DAKOTA—Northwestern Equipment, Inc., 715 11th St., Bismarck; 901 Eighth St., Devils Lake; P. O. Box 110, Dickinson; P. O. Box 152, Fargo; P. O. Box 335, Minot; P. O. Box 626, Wahpeton.
NEVADA—Sierra Machinery Co., 307 Morrill Ave., Reno.
OHIO—The W. W. Williams Co., 914 Main St., Cincinnati; 18301 Brookpark Rd., Cleveland 11; 835 W. Goodale Blvd., Columbus; 1260 Conant St., Maumee.
OKLAHOMA—The Victor L. Phillips Co., 1101 E. Archer, Tulsa; 1222-24 W. Main St., Oklahoma City.
OREGON—Howard-Cooper Corp., Highway 99E, P. O. Box 443, Albany; Highway 99, P. O. Box 86, Central Point; P. O. Box 1, Coquille; First and Van Buren, Eugene; 5821 N. E. Gilsan St., Portland 13; 225 E. 2nd Ave., S., Roseburg.
PENNSYLVANIA—The Capitol Equipment Co., 5100 Paxton St., Harrisburg; Jan A. Wood, 1649 N. Broad St., 905 Hardt Bldg., Philadelphia; Drave-Doyle Co., 2901 Preble Ave., N.S., Pittsburgh 12.
RHODE ISLAND—Parker-Danner Co., 139 Allens Ave., Providence.
SOUTH CAROLINA—South Carolina Equipment Co., 444 Gadsden St., Columbia.
SOUTH DAKOTA—Sioux Road Equipment Co., 500 E. Sixth St., Sioux Falls; Box 941, Rapid City.
TENNESSEE—Wilson-Weesner-Wilkinson Co., 202 W. Morelia Ave., Knoxville; Tri-State Equipment Co., 124 E. Calhoun Ave., Memphis; Wilson-Weesner-Wilkinson Co., 310 S. 2nd St., Nashville.
TEXAS—Alamo Iron Works, Brownsville; Corpus Christi; Tri-State Equipment Co., 500 E. Overland St., El Paso; Conley-Lott-Nichols Machinery Co., 1311-19 S. Ervay St., Dallas 1; Conley-Lott-Nichols Company, 3501 Avenue H, Lubbock; Tri-State Equipment Co., P. O. Box 472, Odessa; Alamo Iron Works, Santa Clara & Montana Sts., San Antonio 6.
UTAH—Kimball Equipment Co., 222 W. 17th St., S., Salt Lake City 10.
VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th St. and Killam Ave., Norfolk; Natural Asphalt Corp. of Virginia, 1901 Hamilton St., Richmond.
WASHINGTON—Glenn Carrington & Co., 91 Columbia St., Seattle 4; Howard-Cooper Corp., 5045-55 - 4th Ave., S., Seattle 8; Intermountain Equipment Co., 611 E. Sprague, Spokane.
WEST VIRGINIA—West Virginia Tractor & Eq. Co., P. O. Box 473, Charleston; P. O. Box 587, Clarksburg.
WISCONSIN—The Stone Manufacturing Co., 321 N. 25th St., Milwaukee 3; Badger Equipment Sales, Inc., Route 2, Thiensville.
WYOMING—Studer Tractor & Equipment Co., East Yellowstone Highway, Casper.
ALASKA—Glenn Carrington & Co., c/o Westward Hotel, Anchorage.
CANADA—Mussens Canada Ltd., Church St., New Brunswick, Fredericton; Coleman Machinery Co., Ltd., 101 Upper Water St., Nova Scotia, Halifax; Mussens Canada, Ltd., 65 Colborne St., Montreal 3; Ontario Equipment & Supply, Ltd., 111 Merton St., Toronto, Ontario; Frost Machinery Co., Ltd., 971 Erin St., Winnipeg, Manitoba; International Agencies & Machinery Co., 2315 Cambie St., Vancouver, B. C.; Mussens Canada, Ltd., Charest Blvd., Quebec.

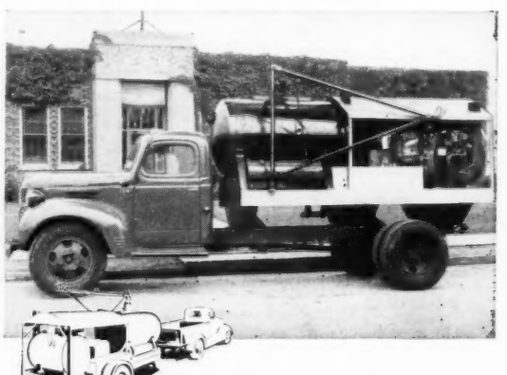
"You get FAST ACTION — to the job... on the job" ... with Cleaver-Brooks oil and bitumen heating equipment!

These self-contained mobile units can be ready to pump, heat and circulate bituminous materials in 20 minutes or less after arrival

If your job can be reached on wheels, any one of these famous Cleaver-Brooks mobile heating units can save you plenty of time and money. Each can be transported as easily as you drive your car . . . put into operation with minor connections — by only one man! Their proven high efficiency, man hours saved, plus elimination of field problems can be important factors in your profit picture. That's why you'll want to know more about famous Cleaver-Brooks Tank-Car Heaters . . . Pumping Boosters . . . and "Deuce" combination tank-car heater and pumping booster. It's the mobile bituminous team that does more work . . . with faster heat, higher temperatures and with less fuel. Write for details. Cleaver-Brooks Company, Dept. F, 397 E. Keefe Ave., Milwaukee 12, Wisconsin.

TANK CAR HEATER — Shoots steam through tank-car coils at 125 lbs. pressure in 20 minutes or less from a cold start. Can be kept going at full tilt all day. Oil firing plus extra high-heat transfer design, assure extra fuel savings. Turbine-type condensate return means less water required. Available in two-car (28 BHP) and three-car (42 BHP) sizes, trailer and skid-mounted models. Ask for Bulletin RM-110.

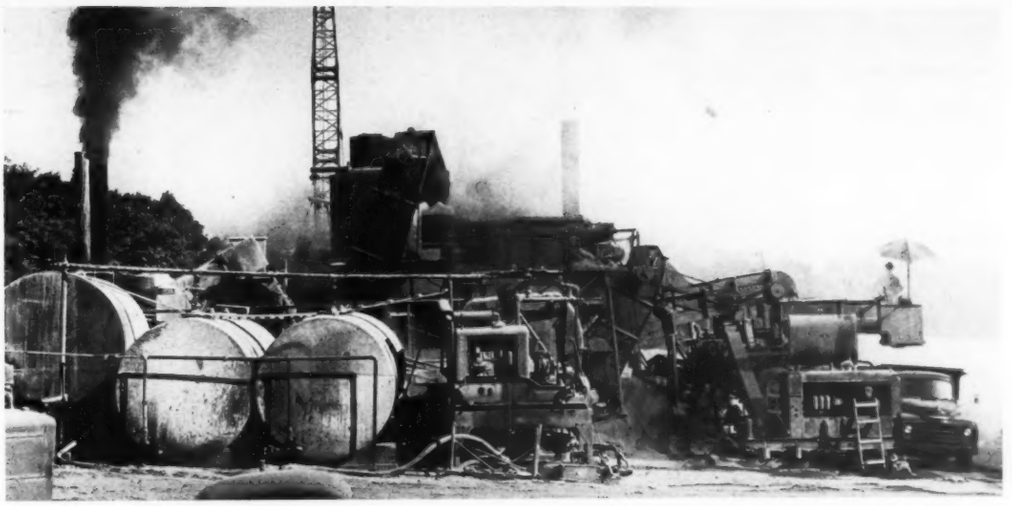
PUMPING BOOSTER — Heats by direct firing 4 times as fast as steam, recirculates, then delivers bituminous materials directly to distributor. Heats only the amount of material required — not necessary to heat entire car. No steam or water required for operation. Has self-contained fuel and gasoline tanks. Available in two sizes, trailer and skid mounted: No. 1A Booster heats approx. 300 GPM temp. rise 25°-35°F; No. 2 Booster heats approx. 350 GPM temp. rise 45°-55°F. Ask for Bulletin RM-107.



"DEUCE", COMBINATION TANK CAR HEATER AND PUMPING BOOSTER — It's a portable steam boiler *and* direct-fired heater mounted on a single frame. Look at this three-job versatility! "Deuce" steam preheats one car to pumpable consistency while circulating and heating a second car to application temperatures. Same unit also pumps and loads distributor or transfer truck. Ask for Bulletin AD-104.

Cleaver-Brooks

Pioneers and Originators of Self-Contained Boilers, Tank-Car Heaters, Pumping Boosters, The "Deuce" and "Peak-Temp"



A Barber-Greene 120-ton continuous-flow plant in action on the widening and surfacing of U. S. 50. The plant was set up about midway on the job to equalize hauls. *Houck Photo*

air drills supplied with air from a Joy-Sullivan 365-cfm air compressor. The rock was loaded into dump trucks by a 1-yard Lorain shovel for the short haul to the primary crusher of the Pioneer plant, which was about 1,000 feet away.

The primary crusher was a Pioneer 24 x 36-inch jaw crusher with a traveling grizzly. Seventy per cent of the material delivered to the crusher required crushing.

The limestone classified as dolomite had a tendency to develop excess fines because of easy shattering characteristics. Menefee screened out the excess and produced a by-product of agricultural lime. The plant was operated 10 hours per day at an average rate of 150 tons per hour, but had some stoppages due to wet weather. It completed its job when 65,000 tons of 1-inch and ½-inch material was stocked at the asphalt-plant site.

Widening

By that time Granite had moved in its Barber-Greene 120-ton continuous-flow asphalt plant and was setting it up while its excavation crews worked on the widening trenches.

Widening crews used a Caterpillar No. 12 grader to top off the shoulder prior to digging the trench. A template lip was added to the grader blade and used to excavate the trench to the required 12 inches. After the trench was cut to depth, the grader was passed over once again to clear the bottom and remove any obstructions. Workmen then checked for final grade and filled any low spots with hand shovels. This was followed by rolling with an Apsco trench roller.

A subbase of 4 inches of 1-inch-minus stone was laid in the bottom of the trench and compacted to 95 per cent with the trench roller. The first lift of AC was 3 inches and consisted of the Missouri specification for B mix using 1-inch stone. This was compacted with the trench roller before the next lift was added. The two succeeding lifts, bringing the trench to the level of the old slab, were 3 inches and 2 inches respectively. These were of the same mix, which was compacted 95 to 97 per cent of optimum to insure voids of less than 6 per cent.

Some of the highway to be

(*Continued on next page*)

Here's the Answer when you want

1. HIGH DENSITY SOIL COMPACTION!
2. MAXIMUM OUTPUT!

Says JACK PRINCE
WESTWAY EXCAVATING CO.
West Los Angeles, California

"BARCO'S PERFORMANCE is remarkable!" writes Jack Prince, Owner of Westway Excavating Co. in California. "We used the Rammer on two engineered fills recently and got maximum results for both density and volume. The material was decomposed granite with a slight clay content. Our requirements were for 125 pounds per cubic foot, dry density. That is real compaction! We compared the Rammer with two other tampers and were really amazed at how much more material the Barco handled.

"Since people in heavy construction have become aware of the necessity for good compaction on all subgrades, it certainly behooves any contractor to check the output of the Barco Rammer."

If you are not already using the Barco Rammer for soil compaction work, find out about it today! *Worldwide Sales and Service.* BARCO MANUFACTURING COMPANY, 518F Hough St., Barrington, Illinois. (*Near Chicago*)

Ask for a free copy of this bulletin, "COST DATA FOR SOIL COMPACTION"

BARCO
"Pegson" Gasoline
RAMMER

For Soil Compaction Close to Walls, Culverts and Abutments — in Trenches, Ditches

- SELF-CONTAINED
- PORTABLE
- ONE MAN OPERATION
- FASTER COMPACTION
- BETTER COMPACTION
- LOWER INITIAL COST
- LOW OPERATING COST
- EASY TO USE, SAFE!

FREE ENTERPRISE — THE CORNERSTONE OF AMERICAN PROSPERITY

Old Concrete Slab Is Widened and Surfaced

(Continued from preceding page)

widened had been made with a drainage lip on the outside edges, but use of these lips has been discontinued by the Missouri State Highway Department. So the widening pours on these sections were designed to come within ¼ inch of the top of the lip, and the final top coat of 1¼ inches covered the lip with 1 inch of mix. This gave the 2-foot widening course a 1¼-inch top coat, and a total thickness over the old pavement of 4 inches, consisting of 2¾-inch binder (B mix) and 1¼-inch surface course (C mix).

Asphalt Plant

The Barber-Greene plant was set up about midway in the job to equalize hauls both ways.

Producing the mix was attended with two important difficulties. One was the inherent quality of the dolomite which shattered easily, thus increasing the undesirable fines merely by each handling. The other was the tendency of the stone to hold moisture, particularly in the 1-inch sizes, which seemed to hold dampness inside although the outside was well dried. There were some good rains during the early part of the job which soaked the stockpiles and made this situation more difficult.

Much of the excess moisture problem was solved by the addition of an auxiliary drier and running the aggregate through two driers before sending it to the hot bins.

Even with double-drum drying it was necessary part of the time to spread and aerate the stockpiled material to remove some of the moisture by natural means before dumping to the bins.

Material Handling

A P&H 455-A ¾-yard crane, with 45-foot boom and using a clamshell, fed the twin bins from the two stockpiles of 1-inch and ½-inch material. A D8 dozer kept the aggregates pushed up within reach of the crane, which had to maintain a 3-point swing from the two piles to the bins.

Each handling increased the undesirable fines and much of this had to be screened out and wasted in order to maintain the quality of the material.

The feeding-crane and dozer kept the bins filled to the 120-ton-per-hour capacity of the plant by keeping busy every minute. However, the road crews were not able to absorb the full output, with the result that production went at about 109 tons per hour or an average of about 900 tons per day. The highest day's lay-down production was 1,095 tons.

Resurfacing

The existing slab was swept clean for the resurfacing. Inequalities of the pavement were taken care of with wedges of type B material which left the entire surface ready for the 1¼-inch type C topping after the binder was laid.

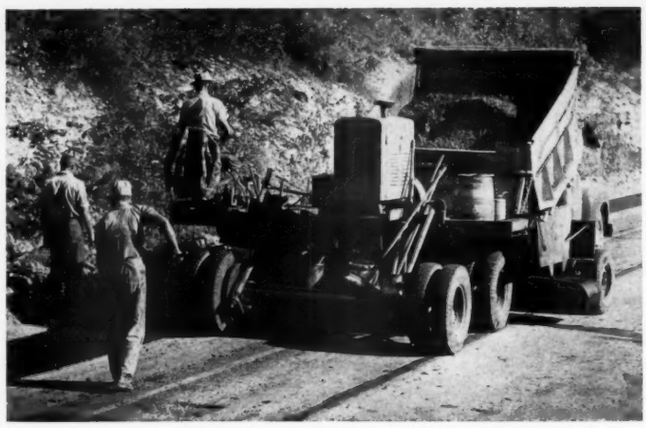
Half lanes were worked one at a time and each half lane was laid out to run either 11 feet 9 inches or 12 feet 3 inches so that the break would not run down the center line.

These are the mixes used by weight:

Type C	Per Cent
Stone, ½-in. max.	58.5
Coarse sand	20.5
Fine sand	12.0
Mineral filler	3.5
Asphalt	5.5

Type B	Per Cent
Stone, 1-in. max.	69.0
Coarse sand	15.0
Fine sand	11.5
Asphalt	4.5

Mix was hauled by a fleet of 8 to 10 privately owned trucks of



An Apsco spreader places a lift on the Missouri widening job. *Houck Photo*

13-yd. HEILINER

BOTH 13-YD. AND 18-YD. HEILINERS HAVE THESE BIG-PRODUCTION FEATURES

● **THE RIGHT POWER, PROPERLY APPLIED**

Exactly right power, correctly applied at the point of action, is the Heiliner solution for greater earthmoving efficiency and production at low cost. Heiliner's "power with a purpose" *utilizes* horsepower instead of wastes it . . . and horsepower saved by more efficient design cuts costs on every phase of the cycle.

● **EXCLUSIVE "TILTING FLOOR" POSITIVE FORCED EJECTION**

This is the simplest type of forced ejection known. The floor of the bowl is hinged back of the cutting blade and simply tilts up to a 75° angle by means of a positive ram action. The load is forced out the wide front opening, while even the stickiest material is scoured from the sides and stationary back of the bowl. Material is dumped fast and clean. There's no leftover yardage to haul back to the pit.

● **BIG PAY LOAD CAPACITY**

Big pay loads mean big profit! Both 13-yd. and 18-yd. Heiliners often carry *more* than the rated capacity, and the more yards you can haul each trip, the less it costs per yard.

● **"PASSENGER CAR" STEERING**

Big, powerful Heiliners handle as easily as the finest car with power steering. With Heil's exclusive, patented Hydro-Steer there's no jack-knifing, no nosing, no snaking. Operators have the "feel" of every operation through the sensitive steering mechanism.

● **INTERCHANGEABLE SCRAPER AND WAGON**

As a double-utility investment, you can't beat the combination of Heiliner two-wheel tractor with interchangeable wagon and scraper. With a 13-yd. scraper and a 15-yd. bottom dump wagon, the 500 Heiliner does the same efficient work, on a smaller scale, performed by the 800 Heiliner's 18-yd. scraper and 20-yd. wagon.

● **MANY OTHER PROFIT-BOOSTING FEATURES**

For faster loading, dirt "boils" up in the *center* of the bowl, heaping front and back evenly in a short digging distance. Haul speed is a fast 25 miles per hour. Big, safe 4-wheel brakes give complete control, empty or loaded. Heil's famous planetary drive provides a low-torque drive for complete utilization of engine horsepower.

ASK YOUR HEIL DISTRIBUTOR FOR COMPLETE DETAILS OF OTHER HEILINER ADVANTAGES

13 AND 18-CU. YD. HEILINER SCRAPERS 20-CU. YD. HEILINER BOTTOM DUMP WAGON 6, 9, 11 AND 16-CU. YD. TRACTOR DRAWN SCRAPERS CABLE POWER CONTROL

various makes, which loaded from the plant at a temperature of 290 or better, weighed and then delivered to an all-purpose Apsco base paver for widening and to a Barber-Greene paver for surfacing—dumping directly to the machines.

Topping was compacted with Buffalo-Springfield 10-ton and 8-ton rollers.

Quantities and Personnel

Total quantities of AC laid down amounted to 67,643 tons divided as follows: B mix, 50,657 tons; and C mix, 16,986 tons.

Granite Bituminous Paving Co., St. Louis, was represented by A. R. Towse, Jr., Superintendent, who had a crew of about 20 working on a 10-hour daylight shift.

An Apsco trench roller compacts the widening material. *Houck Photo*

For the Missouri State Highway Department, E. B. Douglas was Project Engineer, with C. R. Pappenfort, Assistant Project Engineer and E. L. Alberts, Asphalt Inspector. V. B. Saville is Division Engineer and Rex M. Whitton is Chief Engineer of the Department.

loads and hauls
16-cu. yds. per trip!

COMPLETES 1,000-FT. CYCLE EVERY 2½ MINUTES
AVERAGES 350-CU. YDS. PER HOUR!

Look at the heaping 16-cu. yd. load of soft topsoil in this standard 2C500 Heiliner . . . *whose rated heaped capacity is 13-cu. yds.!* Under these favorable conditions, this rig moved 3200-cu. yds. a day of cornfield topsoil, making a round trip of 1000-ft. every 2½ minutes . . . figures verified by work studies made at the job site. This exceptional pay load performance is piling up the profit for Coleman Construction Company of St. Albans, West Virginia, They're using three 13-yd. Heiliners to prepare the railroad site and approaches for a new plutonium diffusion plant in Ohio.

The bonus pay loads and fast cycle time you get with Heiliners are your assurance of profitable production under *the most difficult*, as well as easy job conditions.

Double the utility of your Heiliner with an Interchangeable Bottom Dump Wagon

For roadbuilding, mine stripping, heavy construction, or any earthmoving job where big production of shovel loaded material is a factor, you can double the utility of your Heiliner 800 prime mover by using both the Heiliner scraper and the Heiliner dump wagon *interchangeably.* From every standpoint . . . big capacity, high operating efficiency, rugged construction, low-cost operation and maintenance . . . your investment in these easily interchangeable units will pay big dividends. You can bid confidently on more different types of work and handle them at a profit, without a big investment in other pieces of equipment.

Get complete information about Heiliner interchangeable units before you start your next contract . . . see your Heil distributor for details about Heiliner Wagons.

Heiliner 800 two-wheel tractor and 20-cu. yd. Bottom Dump Wagon. Extra heavy-duty wagon has fool-proof clam type doors which open fast and clean, with the unit moving or standing. There's no bogging down, because doors don't drop below hopper body level.

8-4

THE HEIL CO.

3003 WEST MONTANA STREET • MILWAUKEE 1, WISCONSIN

DEPARTMENT 353

FACTORIES: MILWAUKEE, WIS., HILLSIDE, N. J.

Diamond Saw Blades

New diamond blades for masonry, concrete, and power hand saws are announced by the Robert G. Evans Co., 6315 Brookside Plaza, Kansas City 13, Mo. Cutting segments on the rim of the Target blades are said to be increased 50 per cent in depth.

The new Super-Rim series is said to be suited to the cutting of glazed brick and tile, terra cotta, sewer pipe, stone, quarry tile, and acid brick. The blades, protected by a plastic coating, are made with a solid steel center and are available in diameters from 6 to 30 inches. A color code identifies blades according to their use.

For further information write to the company, or use the Request Card at page 18. Circle No. 45.

New Brochure Discusses Men, Methods, Machinery

A brochure, "Men, Methods & Machinery", relating case histories and reporting on methods and equipment available for the solution of perplexing construction problems, has been released by The Construction Aggregates Corp., 33 N. LaSalle St., Chicago, Ill. The pamphlet was prepared as a service for engineers, architects, public-works officials, and industrial leaders.

It is pointed out that Construction Aggregates Corp. owns and operates equipment valued at $10,000,000; that CAC has saved substantial sums for its clients by original thinking and invention. Use of the Sensibar method of sandfilling is discussed.

Accompanied by numerous illustrations, the brochure includes reports on the following job histories: the Field Museum foundation stabilization in Chicago (1916); the creation of 1,200 acres of land along Chicago's south-shore line for the foundation of the Outer Drive, an automobile highway; the wartime Surinam River project in Dutch Guiana, South America, performed for the Aluminum Co. of America; the New Jersey Turnpike project; and the Steep Rock Lake project in the Canadian lake country.

Rubber Couplings for Pipe

A catalog on rubber couplings for concrete and clay pipe is available from the Hamilton Kent Mfg. Co., 225 Gougler Ave., Kent, Ohio. Tylox gaskets are said to make tight, flexible, and durable joints. The manufacturer also points out that no special tools or skilled labor are needed for installation of the couplings.

A table in the booklet lists a number of installations of rubber pipeline-couplings that are said to be giving service today although first installed as far back as 1891. Photos and drawings indicate how the couplings are installed and how they work to prevent seepage.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 131.

V. Y. Bell (right), Manager of Fleet Sales, Tire Division of the Goodyear Tire & Rubber Co., Akron, Ohio, receives the Silver Anvil Trophy from T. J. Deegan, Jr., of the American Public Relations Association. The award was for Goodyear's "Better Roads Campaign" for stimulating action to prevent strangulation of America's transportation system.

ASTM Has Active Week

Committee Week for the American Society for Testing Materials took place in March—and the week was a busy one. More than four hundred meetings were held, most of them in Detroit, and subjects covered included new research work and specifications and tests for materials. Many new and revised standards were completed.

Much of this material will be considered finally at the ASTM Annual Meeting in Atlantic City during the week of June 19.

Concrete-Reinforcing Bars

A folder on concrete-reinforcing bars and accessories is available from the Capitol Steel Division of Hausman Steel Co., Toledo, Ohio. Wire ties, welded wire mesh, floor lath, wall form ties, block wall reinforcing, and adjustable round-column forms are shown.

Specifications are given including sizes available.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 11.

McGraw, Jr., Joins Bucyrus

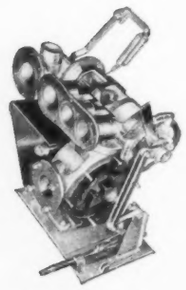
A. William McGraw, Jr., son of Arno W. McGraw, Senior Partner of Bucyrus Steel Products, Bucyrus, Ohio, has joined the firm in the capacity of General Manager in Charge of Manufacturing and Sales.

Mr. McGraw, who has been Manager of Sales for W. A. Riddell Corp., has been a partner in Bucyrus Steel since its inception in 1951. He is now actively engaged in the management of the company, which manufactures cutting edges for road construction and maintenance equipment and for snow plows.

ROSCO'S P. M.*

. . . Accurate application with the Rosco BITUMINOUS DISTRIBUTOR

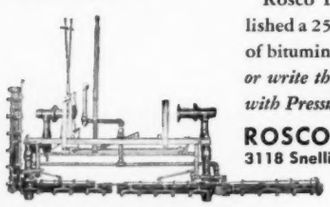
Pressure Metering PATENTED permits the operator to use any length of spraybar—from 1 to 24 feet—*without changing the pressure* and *without any application adjustment whatever.* This "built-in" control of pressure is the only accurate method of obtaining precise bituminous application.



Cutaway View of the Rosco 7-Way Master Valve

Application of bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the revolutions of the pump. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. The rate is automatically maintained by Rosco's patented P.M. system, an integral part of the Master Valve. It's this valve that also directs the flow of material for all of the Rosco Distributor functions.

Rosco Distributors with P.M. have established a 25 year record for accurate application of bituminous materials. *Ask your Rosco dealer, or write the factory for bulletins on Distributors with Pressure Metering.*



The Full-Circulating Rosco Spraybar

ROSCO MANUFACTURING CO.
3118 Snelling Avenue • Minneapolis 6, Minn.

★

PITMAN HYDRA-LIFT

does these jobs and dozens of others . . .

. . . in less time,

C. N. Flagg & Son, Meriden, Conn., handles and lays long joints of steel pipe with their Hydra-Lift.

. . . with less equipment,

Franklin County, Kansas, uses Hydra-Lift to handle timbers, culverts, piling, I-beams, motors, etc.

. . . and less manpower!

Coast Pipeline Contractors, Belmont, Calif., are shown using Hydra-Lift to haul and handle concrete pipe.

With a Pitman Hydra-Lift, your truck becomes part-truck, part-crane; a single piece of equipment does *both* lifting *and* hauling! Hydra-Lift lifts up to 6,400 pounds. Hydraulic power swings boom 180°, lifts boom through arc of 100°; boom telescopes from 12 to 17 to 22 feet; yet Hydra-Lift requires only 40" behind the truck cab—leaves truck bed free for normal payloads. Investigate Hydra-Lift today! Write for details.

Now Available—HYDRAULIC OUTRIGGERS!
Raise and lower outriggers instantly by hydraulic power. Greatly speeds up jobs requiring frequent use of outriggers. Optional equipment.

PITMAN MANUFACTURING COMPANY
300 West 79th Terr. Kansas City, Mo.

Heavy Grading Work For Highway Relocation

Divided Highway Eliminates Tough Curves and Grades On 3½-Mile Section of Route 3 in Rhode Island

• FURTHER modernization of Rhode Island's Route 3 was undertaken last year on a 3½-mile stretch of relocation near the town of Hope Valley. Carrying most of the traffic between lower Connecticut and the capital city of Providence, Route 3 has four lanes except for the 10-mile section from Hope Valley to the State border.

Last spring the State Department of Public Works awarded a $599,244.28 contract to the S & M Construction Co. of Providence to do the grading on the relocation.

The old road was only 18 feet wide, making several sharp S-curves through the hills. Plans for the new road called for a 4-lane divided highway with a 20-foot median. Opposing lanes are 24 feet wide with 10-foot shoulders. Grades and curves conform to modern standards. This contract was for stage construction only (grading and drainage). Included in the contract were interchange roads at the intersection of Route 3 and Route 138 (Kingston Road). The interchange bridge was a separate contract.

The contractor began work in April, 1952, and completed the job last month. About 75 acres were first cleared with Mall chain saws. Rakes mounted on Caterpillar tractors were also used.

Excavation

Excavation totaled about 600,000 cubic yards and included over 150,000 cubic yards of rock. S & M brought in 6 Ingersoll-Rand wagon drills for the rock work, and powered them with one Worthington 600-cfm, one Schramm 600-cfm, and 2 Schramm 300-cfm compressors. For specialized drilling, 3 jackhammers were used with 3 Schramm portable compressors.

Drill steel in lengths up to 24 feet was used with both standard and Carboloy-tipped Timken bits. On wagon drills, bits ranging from 1¾ to 2½ inches were used. On the average, bits had to be changed every 6 feet.

Holes were drilled on 5-foot centers and filled with American Cyanamid 75 per cent gelatin dynamite. Generally, 500 holes were drilled for each shot. About ¾ pound of dynamite was required per cubic yard of excavation.

(Concluded on next page)

CUT JOB-TO-JOB TIME LOSS!
MILLER *Tilt-Top*
gets slow machines there faster!

Where large flat bed trailers are usually too cumbersome for lighter hauling . . . a MILLER Tilt-Top is always handy for moving slow machines from one operation to another. Self-moving equipment practically loads itself onto tilted platform and can be towed to the next operation in jig time . . . cutting non-productive time for operator and equipment to a minimum. Standard platform is 14' x 8', optional 16' available.

MODEL "B" 10 TON $1175.*

The following equipment is optional and extra: hydraulic tilt control, two speed winch, electric brakes.

*Plus freight and Federal Tax.

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Tilt-Top TRAILERS
Trademark reg. Dept. C-5 • 456 South 92nd Street, Milwaukee 14, Wisconsin

AN UNBEATABLE COMBINATION—
G-300 WAGON DRILL MOUNTING + 70-NDC DRIFTER

Combine the drilling speed from the hard-hitting, strong-rotating CP 70-NDC Drifter . . . and the stability of the lightweight but rugged tubular chassis and drill carriage of the G-300 Wagon Drill mounting. Together they form a perfect team to assure faster drilling from every angle.

The CP Wagon Drill has a specially designed feed motor and cone-gear drive with plenty of power, yet sensitive control, to keep the bit in correct striking position. A tubular "H" drill support insures rigidity, cuts down vibration. The complete flexibility of the unit with its ground hugging characteristics enable it to conform to terrain irregularities. For more information write for Bulletin 876. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

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DRY UP FAST WITH "Foundation WELLPOINTS"

Get PRE-BID estimates by competent, practical construction men who have specialized in all phases of dewatering for up to 26 years.

All estimates based on careful analysis of sub-soil borings, on actual experience in the soils to be dewatered, and on site investigations.

When soil conditions indicate other dewatering methods are more practical and economical, we are qualified to advise other proven methods.

26 YEARS EXPERIENCE

Foundation Equipment CORPORATION

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Chicago, Illinois 2608 W. 111th St. Hilltop 5-8282

A Lorain 2-yard shovel works in a rock cut loading an end-dump Euclid. *C. & E. Photo*

One of the four Athey side dumps unloads. S & M Construction Co., Providence, R. I., was the contractor. *C. & E. Photo*

Heavy Grading Work

(Continued from preceding page)

Equipment

The earth-moving equipment lineup consisted of three 2-yard Lorain shovels, one 1¾-yard Link-Belt shovel, six end-dump Euclids, four Athey side-dumps, and six 6-yard Autocar trucks. In suitable areas, Bucyrus-Erie scrapers pulled by International TD-24 tractors were used on an average haul of 1,000 feet.

Earth fill was spread in 1-foot layers and rock in 2-foot layers. Boulders over 2 feet wide were wasted. Compaction was by the regular earth-moving equipment.

By-Pass Road

To divert traffic away from construction areas, the State called for a 2,400-foot-long by-pass road to be built generally parallel to the new highway in the section of the sharp S-curve. It was laid out so that it would later provide a new road for the town of Hope Valley.

Scrapers did most of the excavating and compacted the fills. No borrow was required. Gravel subbase was brought in and compacted to 5½ inches with a 15-ton 3-wheel Buffalo-Springfield roller. The stone was sanded, swept, rolled, and tack-coated with 0.4 gallon per square yard of RT-2 tar.

Traprock was then brought in and spread 2½ inches thick with a Caterpillar grader and hand forks. Afterwards this course was shot with OA-3 asphalt 1.75 gallons per square yard, covered with stone chips, and rolled.

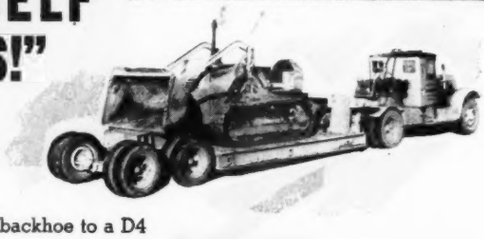
Asphalt was applied with a 1,200-gallon distributor and stored in a 4,200-gallon tank truck. Chips were spread from the back of the truck with a Buckeye spreader. Because the road would eventually be used for township purposes, Fletcher granite curb was used.

Personnel

Antone Lopes, Superintendent for S & M Construction Co., used 100 men on the job. A Fruehauf trailer was partitioned to provide one office for the contractor and one for William Allen, Resident Engineer for the Department of Public Works. The work was under the direction of Lee V. Spencer, State Road Construction Engineer.

"Our MARTIN Folding Gooseneck Trailer will PAY FOR ITSELF IN TWO YEARS!"

Elroy Ernst, Ernst Brothers
Thiensville, Wisconsin



"We haul everything, from a 1/2-yard backhoe to a D4 and end loader, over all types of roads, with our Martin Folding Gooseneck Trailer. We load the clumsy shovel in 6 or 7 minutes and unload just as fast. The ease of loading and time saved alone will enable the trailer to pay for itself in 2 years!"

That's what Elroy Ernst, of Ernst Brothers, contractors of Thiensville, Wisconsin, thinks of their year-old Folding Gooseneck Trailer. You, too, will find a Martin will pay its own way on your equipment hauling.

Your Martin-Caterpillar Dealer will be glad to show you why Martin Folding Gooseneck Trailers can load so fast and save so much . . . call on him!

HERE'S WHY A "FOLDING GOOSENECK CAN SAVE YOUR MONEY!"

- Gooseneck unfolds to form broad ramp — no blocking, no cribbing!
- Loading is simple, one-man operation!
- Structural steel construction gives longer service life!
- More machine work time from less loading — unloading time!
- Decreased liability from increased safety!
- Patented Martin Tandem Axle Assembly gives exceptional tire life — smoothes out road shocks — requires little attention!
- Backing of your Caterpillar Dealer assures economical service!

MARTIN Trailer

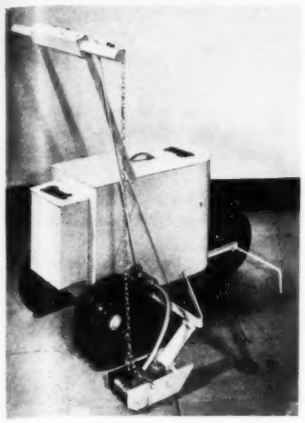
KEWANEE, ILLINOIS
U. S. A.

TIMBERLOCK
Split-Ring
TIMBER CONNECTORS

Timberlock Split Rings comply with all Government specifications as to manufacture and material. Their excellent quality, favorable price, prompt service and acceptability have been proved by their satisfactory use in many projects under Government Jurisdiction. Extensively used in private building and multiple housing projects.

Write for complete information on prices and delivery.
DEPT. CM-4

THE MARSH COMPANY
HASTINGS, NEBRASKA



Traffic-Line Markers

A line of traffic-line markers that paint a line from 2 to 8 inches wide is made by the Aeroil Products Co., Inc., 75 Wesley St., South Hackensack, N. J. A heavy-duty model that holds 9 gallons of paint has a removable paint-screen attachment to keep out skin and impurities. A kerosene-filled compartment is provided with the unit for storing the spreader when not in use.

Other models include 3 and 6-gallon sizes and 9-gallon dual-line markers. On most models the spreader is on one side where it can be seen by the operator, but a Police Department Special unit is made so that the spreader may be used on either side.

Beaded-line spreaders are also available.

For further information write to the company, or use the Request Card at page 18. Circle No. 115.

Flow-On Paint Stripper

An improved method of stripping paint from all types of road-building machinery is announced by the Magnus Chemical Co., Inc., South Ave., Garwood, N. J. It consists of flowing-on boiling 61CF solution made by the company over surfaces to be stripped, and letting it dry on. At the heat of application the drying is rapid. The flowing-on is repeated several times depending on the thickness of the coat of paint.

After the final flow-on the surface is sprayed with a solution of Magnus 23X from a steam gun. This operation removes practically all of the loosened paint. Re-application of the 61CF solution and subsequent steam-gun spraying with 23X may be required in some cases. When all the paint has been removed, surfaces are rinsed off with steam and hot water from the steam gun, leaving clean metal.

For further information write to the company, or use the Request Card at page 18. Circle No. 26.

Hollow-Drill Steel

A folder on hollow-drill steel for removable rock bits is available from the Clifden Rock Tool Co., Inc., P. O. Box 235, Rockaway, N. J. Hexagonal, quarter octagonal, and round hand-held drills are shown, as well as stopers, drifters, and wagon drills. A price list is included. The company also offers a repair service for drills and bits.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 72.

Waterproof Coating

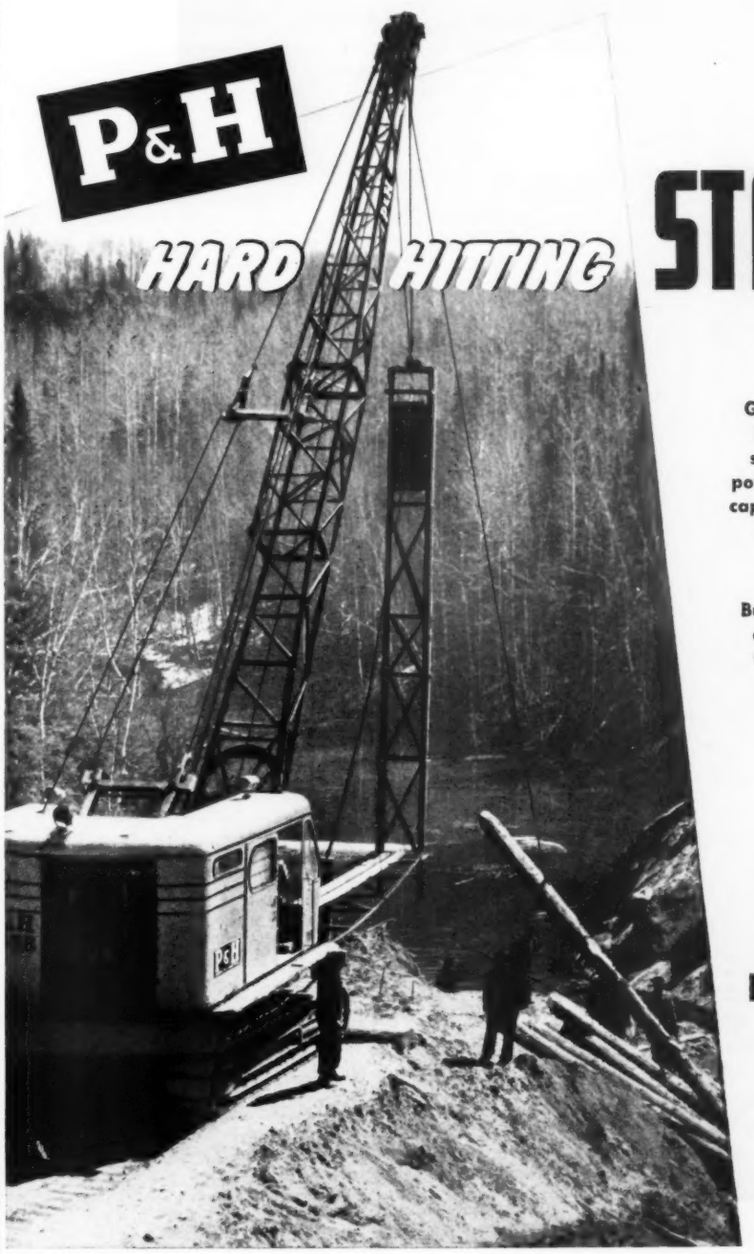
A transparent silicone-base and plastic-emulsion waterproofing material is made by the Dasco Chemical Co., Inc., 1602-04 Thames St., Baltimore 31, Md.

Dascone is said to penetrate and seal masonry surfaces against further water penetration.

The manufacturer points out that since it is solvent-free, the emulsion does not have a high flash point to create a fire hazard to men smoking during application. It may be applied while walls are damp and it does not leave them with a sheen.

For further information write to the company, or use the Request Card at page 18. Circle No. 112.

On the missionary-agricultural development project inaugurated by LeTourneau of Liberia, Ltd., a subsidiary of LeTourneau Technical Institute of Longview, Texas, a Tournatractor with root rake clears jungle growth.



STABILITY

No question about it— you've got it "on the hook" with a P&H!

Greater stability not only lets you handle heavy loads with less danger of tipping strains, but also enables you to use your power more freely — gives you the added capacity to get more done in a day's work. Rolled alloy steels, welded throughout, give you the structural strength to take it in stride.

But it doesn't stop there. True tractor-type crawlers give you the smoothest, surest-footed mobility you've ever known on a power crane or shovel. You can turn gradually, sharply, or right about-face — maneuver in and out of tight corners with perfect ease.

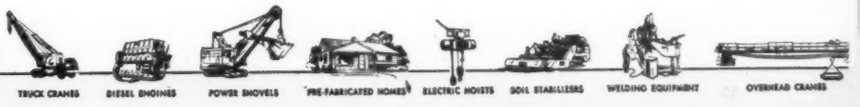
You've heard P&H owners brag about what their machines will do. Isn't it time to find out for yourself? You've nothing to lose, much to gain in modern performance and lower costs.

P&H POWER SHOVEL AND CRANE DIVISION
HARNISCHFEGER CORPORATION
MILWAUKEE 46, WISCONSIN

See your P&H Dealer!

Look to P&H for the most modern features in Power Shovel and Truck Crane construction. There's all-welded design, live roller circle, triple-safe boom hoist, hydraulic control, plus a low center of gravity that provides a higher ratio of lifting capacity to gross weight. This means more WORKABILITY . . . BETTER PERFORMANCE . . . GREATER SAFETY. Write for literature on the size you need.

the P&H Line



New Masonry Surfacer

A masonry surfacer said to prevent seepage through stucco, brick, cement, and cinder-block exterior walls is offered by Stroub Products Co., Inc., Totowa Borough, N. J. According to the company, Anchor masonry surfacer contains an aggregate powdered finer than talcum. Moisture in the wall is said to carry this material into open pores and crevices, where it hardens, sealing the leaks. The surfacer is mixed with water and applied with a whitewash brush. It comes in seven colors and white in 12, 25 and 60-pound cans.

A companion product, Stroco Anchor Plug, is said to stop active leaks where pressure is present.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 93.

The 300-ton Burmeister dry-batch plant has a 1,000-barrel cement-storage capacity and a 135-tons-per-hour aggregate elevator. The aggregate is fed by a 24-inch tunnel conveyor. For further information write to L. Burmeister Co., 4535 W. Mitchell St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 145.

Phones on Parkway

Recent surveys show that motorists make surprising use of roadside phones on New Jersey's Garden State Parkway and in various other locations on the State Highway system. More than 150,000 calls were made last year from eight installations, according to Ransford J. Abbott, State Highway Commissioner.

Included in the plans for lengthening the Garden State Parkway from Centennial Ave., Cranford, N. J., to U. S. Route 22, Union Township, Union County, N. J., are arrangements for locating three roadside phones on the new section—one on the southbound road near Burke Ave., Union Township; one at Centennial Ave. in Cranford; and a third, for northbound traffic, near Michigan Ave., Kenilworth.

Groundless Electrode Cuts Stone, Concrete

A new electrode said to cut and pierce stone, cement, concrete, and refractory materials is announced by the ChemoTec Division, Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing, N. Y. The DynaTrode creates its own arc. It requires no ground and does not have to be struck upon metal. The arc is 5 to 8 inches in length.

The self-energizing arc rod has a heavy coating that is reduced more slowly than the core. This forms a crucible or tube of coating through which the energy is concentrated into a fine tip. The manufacturer explains that the thermal ionization of the coating by the arc stream combined with the concentration produces the conditions necessary to pierce and melt the refractory material.

The electrode will operate with a 250-amp DC welding machine. Compressors, air line, oxygen tanks, and pneumatic drills are not necessary. Uses suggested by the manufacturer include piercing holes in concrete, exposing buried pipe by cutting away surrounding masonry, and cutting sewer pipe.

For further information write to the company, or use the Request Card at page 18. Circle No. 124.

Line of Scooter Trucks

Literature is available on small motor - driven tricycle - mounted trucks that carry and dump bulk materials. Scoot-Crete trucks are made in a variety of models including a unit that lifts its load up to 60 inches above floor level, and dumps or pours it into forms, vats, and bins. Capacity of this model is 2,000 pounds. Other units have interchangeable tilting box bodies and platforms.

To obtain this literature write to Getman Bros., Mfg. Div., South Haven, Mich, or use the Request Card at page 18. Circle No. 95.

Tuffy®

7 Ways Better for DRAGLINES!

"Gives Better Service Than Any Other Rope"

Says Maintenance Superintendent of Arkansas Construction Company

(Name on Request)

(1) Wires of finest steel in a (2) construction specially designed for universal dragline service give Tuffy (3) extra flexibility . . . make it (4) extra easy to handle. You'll find Tuffy Draglines (5) spool better and (6) ride better on grooves. And you get (7) maximum abrasive resistance since Tuffy materials are toughened to withstand *more* abrasive wear! Time and again, Tuffy Draglines stand up under more days of service and move far more yardage than the best previous average obtained by many operators . . . operating in dry dirt, wet dirt, sand, gravel, rock and minerals! To order, just ask for the length, the size and the name—TUFFY DRAGLINE!

Send For This FREE Folder on Tuffy DRAGLINES

MAIL COUPON TODAY

UNION WIRE ROPE CORP.

Specialists in Wire Rope and Braided Wire Fabric

2260 Manchester Ave., Kansas City 3, Mo.

Please send me the FREE illustrated folder on Tuffy Dragline.

Firm Name_____

By_____ Title_____

Address_____

City_____ Zone____ State_____

Now Available TEALE Dozer-Loader

COMBINATION DOZER-LOADER For REGULAR CRAWLER TRACTOR

Here's the Teale Dozer-Loader with bucket raised to full height of 8½ feet at point where bucket hinges on frame.

This is a quality-constructed combination dozer-loader that can be put on regular crawler tractors, and is built for hard work. Put it on—take it off—easily. Price for COMPLETE LOADER includes Hydraulic pump, HYDRECO heavy-duty valve, and all parts necessary to mount on your tractor—ready for work. NO MODIFICATION OF TRACTOR IS NECESSARY. (Dozer blade extra.)

TD-9, D-4, and HD-5 . . . . . $1850.00

TD-6, D-2, and Cletrac A & B $1775.00

All prices f.o.b. factory

Write for Specification Folder and name of nearest dealer, Today.

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TEALE & CO. P.O. Box 308 Omaha, Nebraska

Tuffy® stays with Scraper Longer in Tough Going!

"No Other Rope Even Comes Close to Comparing with Tuffy Scraper Rope"

Says an Iowa Contractor

(Name on Request)

More and more operators of scrapers are switching to Tuffy Scraper Rope . . . and there are good reasons why! Tuffy is so designed to resist drum crushing caused by rope cross-overs—flexible enough to withstand sharp bending and hug sheave grooves. Tuffy's good slack line behavior helps it hold up better under the shock of load impact on slack line—a condition multiplied in scraper service. Remember, Tuffy is easy to order; just specify length, diameter and "Tuffy!"

Send For This FREE Folder on Tuffy SCRAPER Rope

MAIL COUPON TODAY

UNION WIRE ROPE CORP.

Specialists in Wire Rope and Braided Wire Fabric

2260 Manchester Ave., Kansas City 3, Mo.

Please send me my copy of the FREE illustrated folder on Tuffy Scraper Rope.

Firm Name_____

By_____ Title_____

Address_____

City_____ Zone____ State_____

Rock Salt Makes Gravel Road Firm

Stabilized Surfaces Last Longer; Damage and Repair Bills Decrease

By F. GLENN KELLY,
Road Superintendent, Perry, N. Y.

• USE of rock salt over a 10-year period to stablize gravel roads in Perry, N. Y., has enabled the town to save money every year because of the fact that rock salt makes the road surface last longer than it otherwise would and greatly reduces maintenance work and repairs. In addition to this, it keeps the road surface hard during rainy seasons, prevents rutting, and, during periods of dry weather, helps to eliminate dust.

It has been estimated that the cost of putting down such a road is less per square yard than the cost of the granular materials that are blown away as dust or knocked to the side by traffic every year when the road is not stabilized. Suction created by cars passing at high speed pulls off far more dust and gravel than most people realize and causes the road to wear away at a rapid rate. Besides this, when unstabilized roads are muddy, considerable gravel is lost as tires throw mud onto car bodies.

Material and Application

Building a rock-salt stabilized road is a simple operation that can be done with whatever equipment the road department has on hand. In general, the following are needed: a motor grader with scarifier attachment; a rock-salt spreader; a water sprinkler; a pneumatic roller; and dump trucks for hauling. In building the Perry roads rock salt was spread on the base, 4 inches of fine gravel was added, then more rock salt was spread on top of that, using altogether 10 tons of rock salt for a mile of road.

For successful results, the gravel must have a binder material in it, such as clay, and, in addition, the rock salt must be well mixed with the gravel. This can be done by blading gravel and rock salt to the center of the road, then pushing it in equal proportions to the sides.

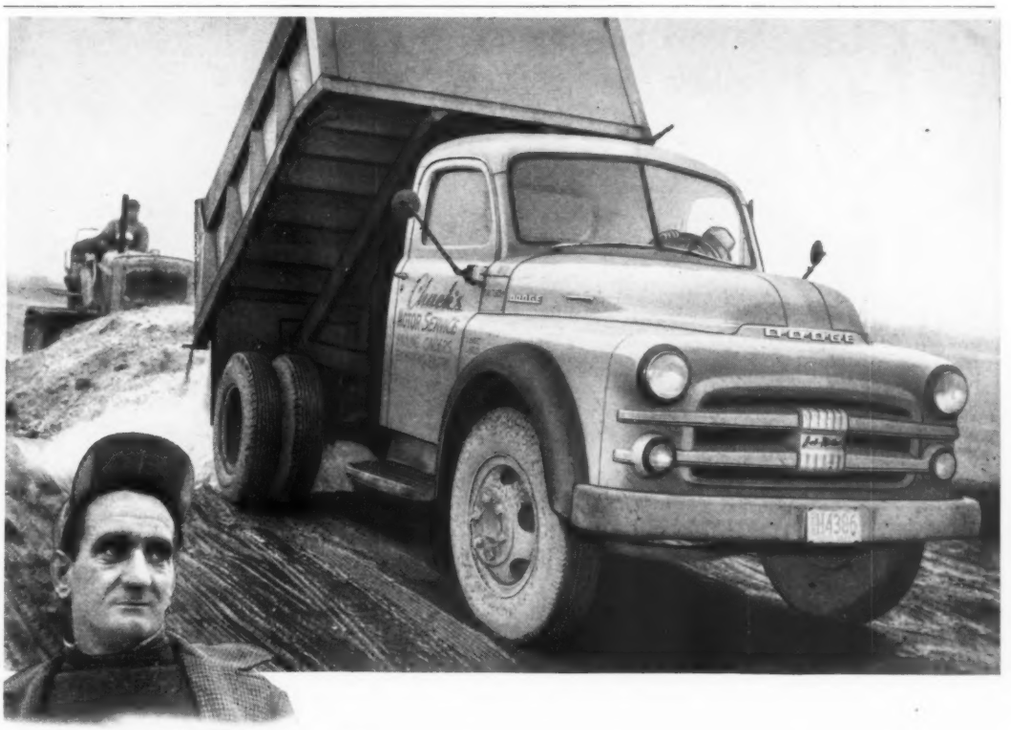
Following this mixing operation, the base should be wet with a sprinkler, an inch of the gravel-rock-salt mix put down, and then rolled with pneumatic tires. It is a good idea to follow this procedure of laying an inch of the mix, wetting, and rolling until the entire surface has been spread, because this will give maximum compaction from the base up.

When rolling has advanced to the point where the surface has been securely knit together, enough water should be added to flush the surface. Rolling should then be resumed until all excess moisture is dispersed and the surface takes on a hard glazed appearance. The road sets within 24 hours with a dry water-resistant surface, and will last from 2 to 3 years.

A Hard Dry Surface

Use of rock salt in the road helps to hold the gravel together, making possible the dry hard surface which is a characteristic of these roads. Furthermore, rock salt keeps the road surface and the base from freezing during the winter and in that way eliminates the recurring cycles of freezing and thawing, contraction and expansion, that cause so much damage on roads and add greatly to the repair bills. On the Perry roads the number of potholes has been considerably reduced. When they do occur they are repaired with a rock-salt and gravel mix as a means of minimizing further damage and of maintaining a smooth surface.

A liquid-filled flexible U-tube, the Levelall, is a new leveling device utilizing the fact that water seeks its own level. The liquid levels at both ends of the tube are, of course, level with each other. For further information write to the Levelall Co., 81 Webster St., Rockland, Mass., or use the Request Card at page 18. Circle No. 14.



"Our Dodge trucks just go and go!"

. . . says **CHARLES BENDA**, *Owner, Chuck's Excavation Service, Chicago, Ill.*

Why new DODGE *"Job-Rated"* TRUCKS are a better buy for Construction Men

HIGH-POWERED FOR HEAVY HAULS!

Dodge gives you the might and muscle to move those big loads *in a hurry!* Seven hefty power plants, three brand-new—from 100 h.p. to 171 h.p. It's real economical power, too. High compression ratios, 4-ring pistons, chrome-plated top rings and a host of other features combine to help keep your gas and oil expense at rock-bottom levels. And extra-powerful dual primary brakes, in 1- through 4-ton models, assure safer stops with less pedal pressure!

BIG PAYLOADS FOR BIGGER PROFITS!

With a Dodge *"Job-Rated"* truck, you can haul man-sized loads on a small-sized budget! New, bigger load capacities on many models enable you to carry more money-making payload every time out. Moreover, those rugged Dodge frames, sturdy axles and extra-strong springs are built to withstand toughest use for years without breakdown. See your Dodge dealer for the full story on Dodge extra value. He's making mighty good deals right now.

"Contract hauling and excavation work can be rough work sometimes. You never know from one day to another what your next job will be like. That's why I need trucks that can handle any kind of job that may come up. And Dodge is my choice down the line!

"That Dodge power is as steady as a mule. It has the ability to pull full loads out of deep basement excavations, and the dependability to keep coming back for more. My Dodge trucks are plenty economical, too. I haven't found any other make that can come close to Dodge for good gasoline mileage!"

DODGE
"Job-Rated" TRUCKS

300 pounds
or
20,000 pounds
each hour

Any Amount • Any Type
BITUMINOUS PATCH MATERIAL

with the Barber-Mixall Greene

THIS FREE BOOK

see your B-G distributor or write
Barber-Greene
AURORA, ILLINOIS, U.S.A.

Small Tandem Roller

A ½-ton general-utility roller is made by Gabb Special Products, Division of E. Horton & Son Co., Windsor Locks, Conn. The Motoroller is recommended for use in conjunction with larger rollers for rolling in confined areas and removing creases left by the heavier equipment.

The roller is available with a water tank and spraybar attachment to prevent the blacktop from picking up on the drums. It has a forward-reverse transmission said to give instantaneous reversing under full load. Constant-speed ratio is provided in either direction.

The unit can be transported easily from job to job.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 104.

The Motoroller general-utility roller is recommended for rolling in confined areas.

Caulking Compound Resists Cold Weather

An elastic caulking compound has been used to keep out cold in 60 degrees-below-zero weather, according to the manufacturer, A. C. Horn Co., Inc., 10th St. and 44th Ave., Long Island City 1, N. Y. Vulcatex is made in knife and gun-grade consistency and is said not to dry out, crack or shrink. Its standard color is grey, but it is also available in white, limestone, brown, black, red, green, and dark grey. To match the color of the caulking compound with the surrounding surface the joint may be striped with an exterior paint.

The product is recommended for joints between masonry and window frames, stone copings, glass bricks, steel sash, masonry construction, and wood frame construction.

The compound comes in small packages, 10 of which equal a gallon. It is also supplied in bulk, in standard containers, drums, half drums, 5-gallon pails, and 1-gallon containers.

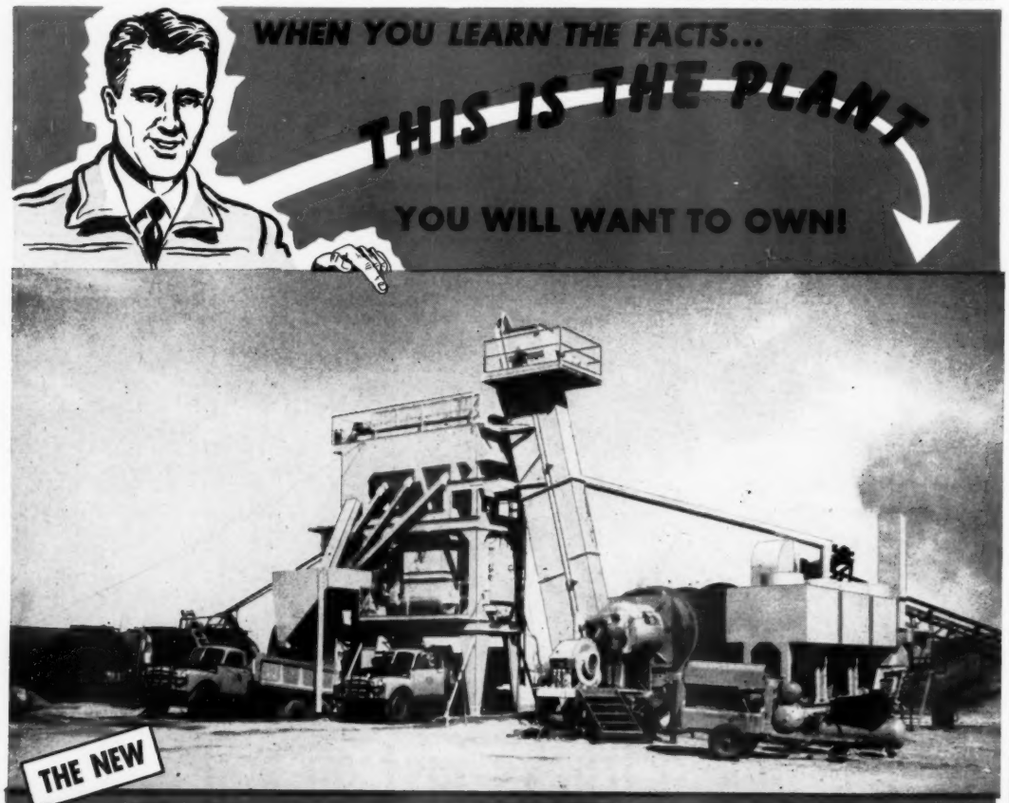
For further information write to the company, or use the Request Card at page 18. Circle No. 130.

Where to Buy Lumber

A 1953 directory telling where to buy lumber has been released by the West Coast Lumbermen's Association, 1410 S. W. Morrison St., Portland 5, Oreg. The information is arranged to assist the buyer in selecting mills that furnish the lumber he needs. Details are given on capacities, equipment, and special services, and on lumber items manufactured. The columns on rough and surfaced timber give maximum sizes available.

The list includes sawmills, remanufacturers, fabricators, wood pipe and tank manufacturers, glue-laminating plants, and wood-preservation plants.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 32.


WHEN YOU LEARN THE FACTS...
THIS IS THE PLANT
YOU WILL WANT TO OWN!
THE NEW
MADSEN
MODEL 481
Portable 4000-LB.
BATCH CAPACITY
ASPHALT PLANT
Study the features below . . . never before has a manufacturer of asphalt plants incorporated so many cost-saving, money-making advantages in one plant. MADSEN now gives you all these, and more, in the new MADSEN Model 481 Plant.
Oversize throughout . . . larger elevator, screen, bins, weigh-box, mixer and drives.
Faster mixing cycle . . . all air-operation of bin gates, asphalt pressure injection and mixer gate, reduces operator fatigue which means added tonnage at the end of the day. Air controls are faster, more accurate, decreasing time cycle from bin to truck.
New bin design (Patent Pending) . . . eliminates segregation, provides uniform aggregate withdrawal, promotes improved aggregate distribution in weigh-box.
New weigh-box . . . oversize capacity, air-operated gate, 4-point lever suspension, roller-mounted so it may be quickly and easily rolled out of the way for field maintenance.
New Model 440 Pug Mill (Patent Pending) by MADSEN . . . with externally removable sectional liners, ground to precision fit at the factory for complete interchangeability and no field fitting. Has improved mixing action, faster discharge, built-in oversize capacity, and is precision jig-built throughout.
Improved drive arrangement . . . individual electric motors on hot stone elevator, vibrating screen, dust elevator, dust entering screw conveyor, pressure injection pump. Mixer may be driven by either electric motor or direct by Diesel.
Generous use of adequate gearhead motor units . . . fully enclosed anti-friction bearing gear box on mixer drive.
Madsen Pressure Injection System (Patent No. 1987243) . . . the asphalt is pumped into the mill in 5 to 7 seconds! . . . the fastest known method of placing every drop of asphalt into the mill.
In all fairness to yourself . . . before you buy any asphalt plant, learn all the facts about the new MADSEN Model 481 Plant. You'll be glad you did.
If you're interested in an asphalt plant, you owe it to yourself to get the complete story on the new MADSEN Model 481 Plant.
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NO. 5 CANCAP 4 1/16" to 5" $3.75 ea.
NO. S-3 CANCAP —fits John Deere A, B, D, G, M, R tractors $1.90 ea.

Concrete-Mix Truck

A new tandem truck for transit concrete mix or dump bodies has its center of gravity shifted forward to permit the hauling of heavier loads within existing weight limitations. The manufacturer states that the new truck will haul 6 yards of concrete as against the normal 4½ or 5 yards.

To allow for this extra weight at the front, the new Reo truck features a 14,000-pound front axle, extra-heavy progressive-type front springs and full-power steering.

The unit is available in wheelbases ranging from 150 to 203 inches. It is powered by Reo's Gold Comet gasoline engine. The company also plans to produce the truck with its liquid-petroleum-gas engine as optional.

The cab features a new adjustable seat, a new instrument panel, relocated steering wheel and foot pedals, and improved vision. A 50-gallon step-type gasoline tank is located on the driver's side.

The truck has 11.00 x 20 tires on the front, and 10.00 x 20 on the rear. Gross vehicle weight is 45,500 pounds.

For further information write to Reo Motors, Inc., Lansing 20, Mich., or use the Request Card at page 18. Circle No. 102.

Portland Cement Hardener

Literature is available on a liquid compound said to increase the durability of mortar and concrete by increasing the hydration of portland cement. Anti-Hydro can be used in cement plaster, cement stucco, cement for brick mortar, job-mixed cement paint, and to harden cement and concrete floors.

Separate specification sheets give directions for use with details on how to apply the compound and how much to use for each type of work.

To obtain this literature write to the Anti-Hydro Waterproofing Co., 265-277 Badger Ave., Newark 8, N. J., or use the Request Card at page 18. Circle No. 134.

Miami Branch for Orban

The opening of an office at 1816 20th St., Miami Beach, Fla., has been announced by Kurt Orban Co., Inc., importer of sheet piling, building materials, steel and nonferrous metals, and industrial equipment.

Arthur Nichols, formerly in charge of the company's Boston office, is Manager of the new branch.

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Turn handle one way to fill, the other way to empty. 7 to 10 gals. per min. For fuels, lubricants, road oils, etc. Fully guaranteed.

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The new Reo tandem truck is said to haul heavier loads within existing weight limits.

ARBA Officer Retires

After forty years of continuous service with the American Road Builders' Association, Washington, D. C., Ethel A. Birchland has retired from her position as Assistant Secretary. Miss Birchland joined the business department of ARBA in 1913, and became the organization's Secretary in 1923, a post she held until 1928. She joined the editorial staff of ARBA's publication, *Road Builders' News*, when it was revived in 1945.

Standardized Structures

A booklet on standardized steel-frame structures is available from Luria Engineering Co., 500 Fifth Ave., New York 36, N. Y. The illustrated publication explains the advantages of standardized construction, stressing lower over-all cost, permanence, speedy erection, and flexibility. The structures, according to the company, provide more usable building space, can be adapted to meet special requirements, and can meet building codes.

To obtain this literature write to the manufacturer on your company stationary, or use the Request Card at page 18. Circle No. 132.

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Reg. U.S. Pat. Off.
THE PIONEER TRUCK SHOVEL

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4 Models—In *"QUICK-WAY"* you have your choice of four models. Model L—1/2 cubic yard, 10 ton crane. Model E—4/10 cubic yard, 7-1/2 ton crane. Model S—1/3 cubic yard, 5 ton crane. Model J—1/4 cubic yard, 3 ton crane. For Standard Trucks and Special Carriers.

Two Hoists—One Boom—For erecting steel, installing heavy machinery, or any other work requiring the utmost accuracy, the *"QUICK-WAY"* Power Down, Worm Gear Drive, Boom Hoist gives the operator full power control of the load, either up or down to within a fraction of an inch. This installation does not affect the standard live Boom Hoist. This gives two different Boom Hoists at the operator's finger tips at all times.

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By WILLIAM H. QUIRK
Editor

Navy's Bureau of Yards and Docks

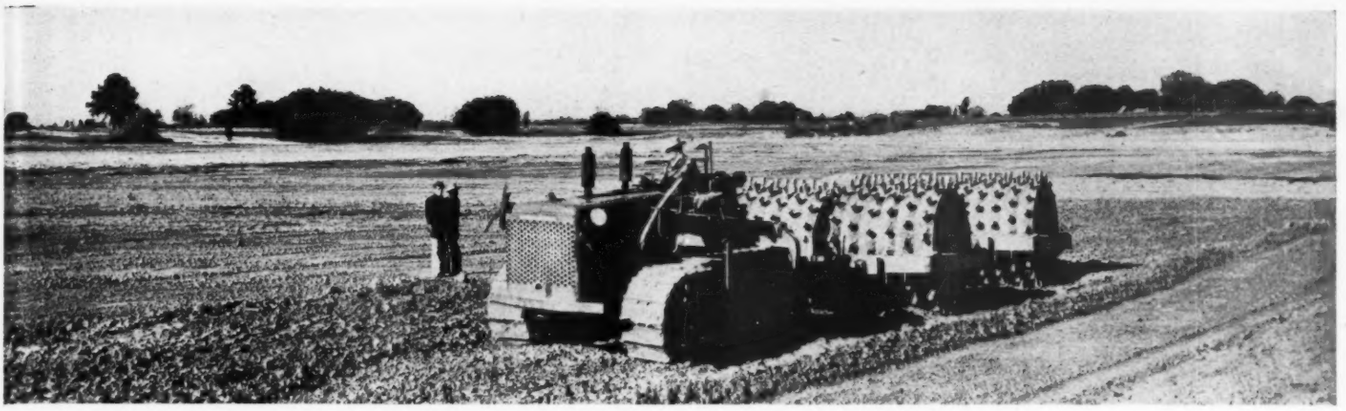
Builds Supply Depot for the Marines—Preparing the 3,700-Acre Site

• ALBANY, Ga., in the heart of the Deep South, is a junction city that forms a hub for rail and highway transportation. Its excellent connections to the Atlantic port cities of Savannah and Jacksonville, and to Pensacola and Mobile on the Gulf of Mexico, were major factors in the selection of this location by the U. S. Marine Corps as a site for its biggest supply depot.

This 3,700-acre site in southwestern Georgia lies 5 miles southeast of Albany on State Route 35, and is roughly 6 miles long x 1 mile wide. The Atlantic Coast Line Railroad runs along the northern boundary, while a spur of the Georgia Northern Railroad enters the area from the west. The depot will have a 400-car railroad classification yard. Before the construction commenced, the big tract was either farming land or given over to pecan trees.

Work on the project started in October, 1951, with clearing and

At left is a section of the big ditch, nearly 6 miles long, that is being cut to drain the depot site. Below, an International TD-24 tractor push-loads a Wooldridge Terra Cobra scraper digging out the ditch at its intersection with a reinforced-concrete feeder pipe.



Also at work in compacting fills on the site is this set of Grace dual-drum tamping rollers pulled by an International TD-18A tractor.

grading contracts. This was followed closely by the construction of drainage facilities, access roads, streets, bridges, and railroads. Early in 1952 building got under way on ten warehouses, each 200 x 1,000 feet, which is the major contract at the depot and is described in the accompanying article. Construction is being handled in stages, and facilities are put into operation as they are completed. Two warehouses were completed this spring, and the other eight are scheduled to be finished this summer and early fall. In addition, a contract for seven more of the large warehouses was let in October, 1952, to Batson-Cook Co., West Point, Ga.

The first increment of the project will cost around $23,000,000, and will probably take until 1954 to finish, while future work proposed will probably total approximately $65,000,000. Eventually the Albany, Ga., facility will supply every U. S. Marine installation east of the Mississippi River. Internal transportation will be provided by 16 miles of highways and streets, and 22 miles of railroad. Three deep wells supply water, and the cantonment area will include a sewage-disposal plant, fire department, theater, and shipping center.

Developing the Site

All design and construction which is under the cognizance of the U. S. Navy Bureau of Yards and Docks is being accomplished under the supervision of the District Public Works Officer, 6th Naval District, Charleston, S. C. The initial contract was awarded to the J. A. Jones Construction Co., of Charlotte, N. C., on a low bid of $1,700,000 for site development that included grading, drainage, roads, and part of the water-supply system. Work on this contract started in October, 1951, and was finished last July. The Wright Contracting Co., of Columbus, Ga., sublet most of the contract items from Jones. On April 1, 1952, Wright was awarded an $867,000 contract of its own for water lines and storm sewers. Bailes-Sey Co., of Jacksonville, Fla., was the successful bidder of a $365,000 contract for approximately 8 miles of railroad.

One of the principal features of the site development was the excavation of a large drainage ditch that eventually will be nearly 6 miles long. It will drain the depot area, and empty into Flint River about 2½ miles from the edge of the site. The ditch is 22 feet wide at the bottom, with 2½ to 1 side slopes. Maximum depth is 20 feet, but the average depth is 8 to 10 feet.

Jones dug the present portion of the ditch within the depot area, while the 2½-mile section to the river beyond the property line was handled by the Pafford Construction Co., of Waycross, Ga., under a $132,000 contract. Other items in this award included sewage-disposal lines, together with two railroad

(Continued on page 44)

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On the Maxi Crane Carriers designed for loads to 30-ton and for fast travel and maneuverability, high strength Diamond Roller Chains drive both sets of wheels from the main shaft.

As with all types of heavy construction equipment, the great reserve strength and uniformity of quality of Diamond Chains are important in providing the long-life service, dependability, and continuity of operation needed to insure maximum steady output.

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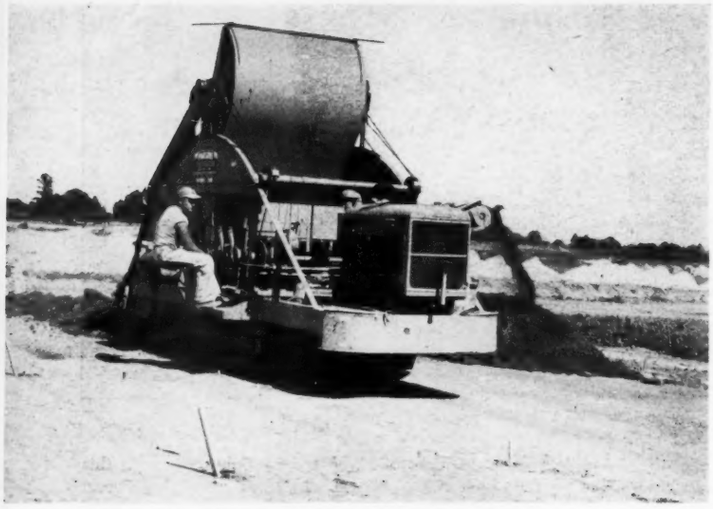
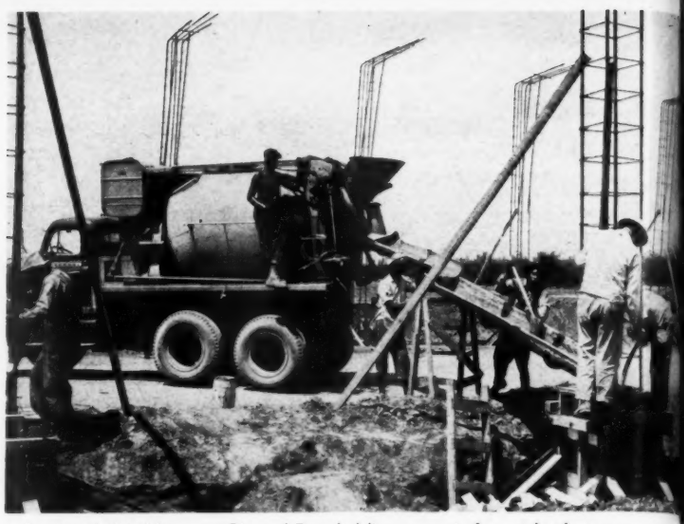
Above: Maxi Crane Model Carrier, made by Six Wheels, Inc., Los Angeles. Diamond Chains drive both sets of rear wheels on each side.

DIAMOND ROLLER CHAINS



A Parsons 250 Trenchliner begins excavating for the footing foundations.



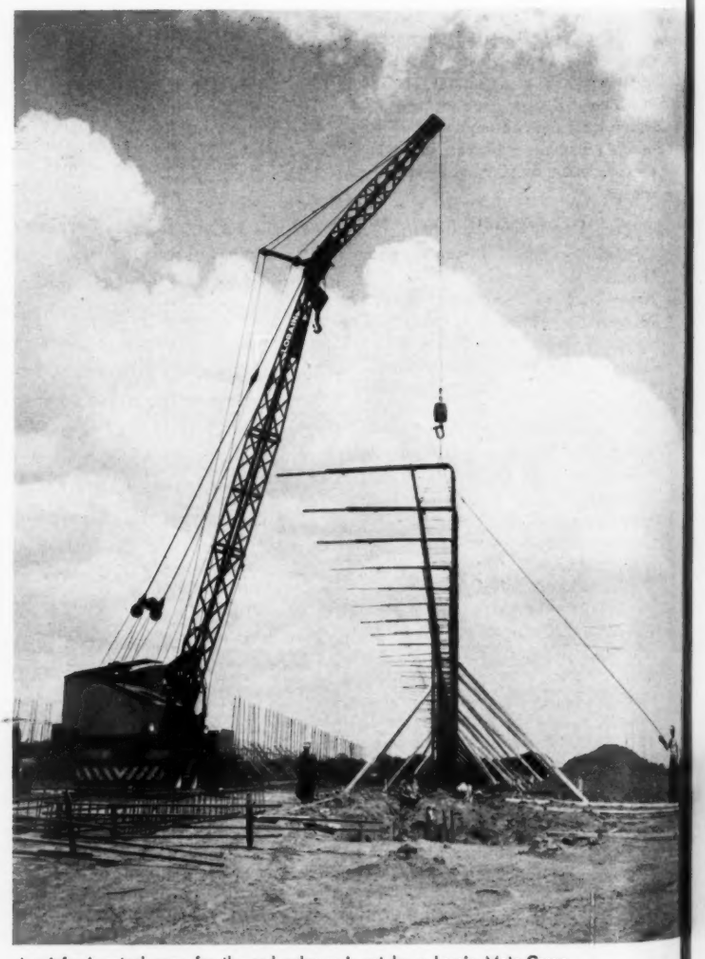
A Rex 5-yard Moto-Mixer on a Diamond T truck delivers concrete for a stub-column pour.

A Gradall cuts out to neat lines the center portion between two parallel trenches.

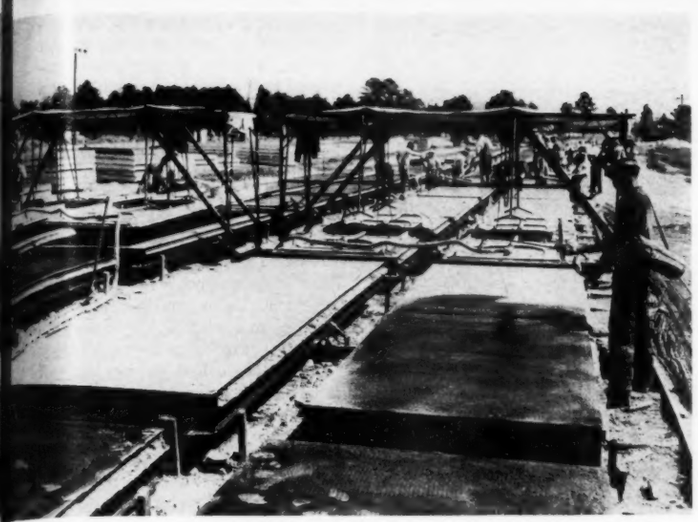
Navy's Bureau of Yards and Docks

Builds Supply Depot Constructing 17

Footing forms are filled with concrete. The four vertical rods are for the stub columns.



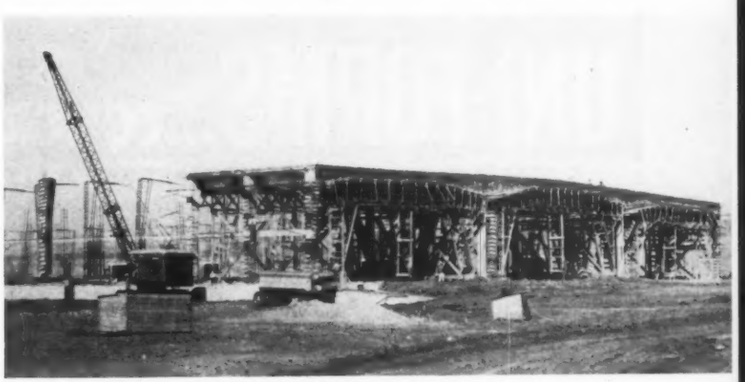
A reinforcing-steel cage for the end columns is set by a Lorain Moto-Crane.



A gantry handles vacuum mats in the casting yard on the second warehouse contract.

On the first contract a panel is stripped with a vacuum lifter the day after the pour.

for the Marines— Huge Warehouses



Gantry formwork for poured-in-place rigid frames.

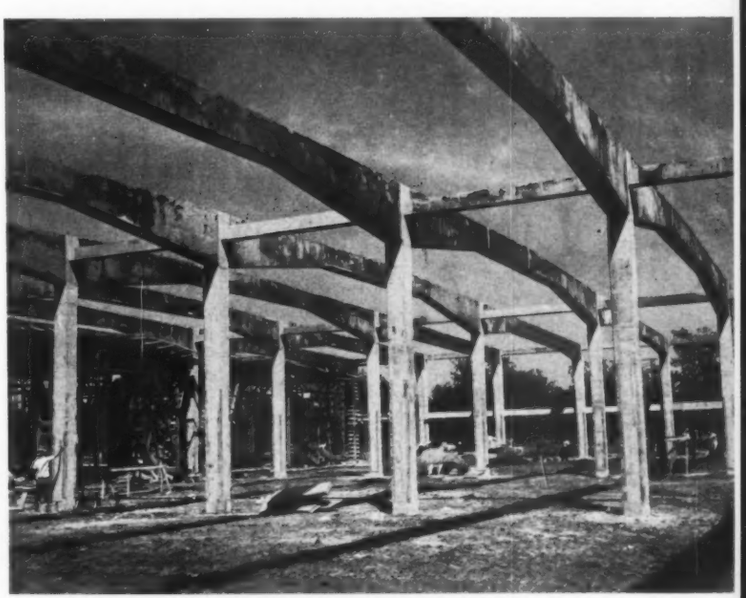
(Photo on page 1)

• LARGEST contract to date for the new U. S. Marine Corps Depot of Supplies, Albany, Ga., covers the construction of ten huge warehouses each 1,000 feet long x 200 feet wide, and having an interior vertical clearance of 21 feet 6 inches to low point of rigid frames. The contract went to Grannis & Sloan, Thompson, Street & Wattinger Co., of Charlotte, N. C., on a low bid of $10,383,000. Work got under way on January 21, 1952, and by the spring of this year, two of the units were finished. The remaining eight are expected to be completed this summer and early fall.

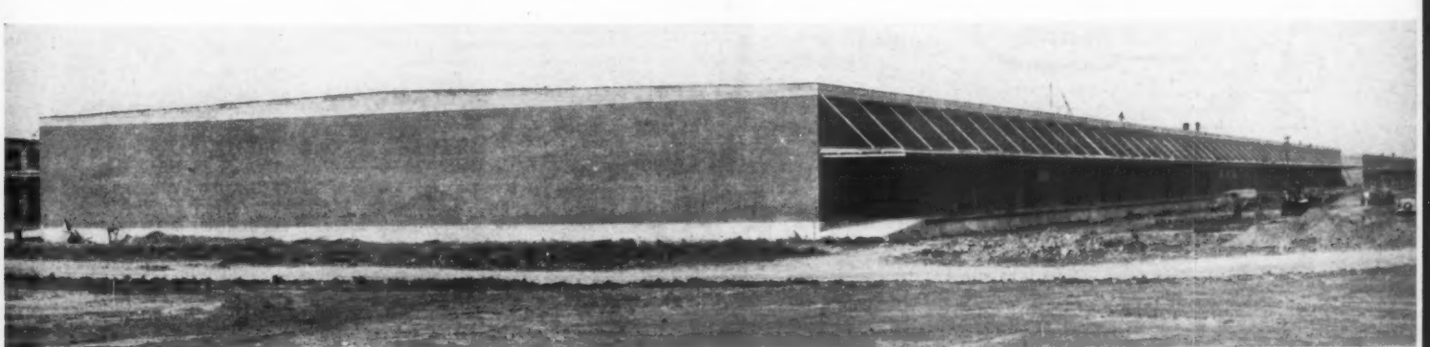
The warehouses are all of similar design and construction with reinforced-concrete foundation footings, concrete floor slabs and roofs, and masonry walls. Footings are laid out in four rows running the length of the warehouse to support the exterior columns along each side, and also two rows of interior columns. Longitudinally the columns are spaced on 18-foot 6-inch centers, while they divide the width into three spans of 64 feet 10 inches, 70 feet 4 inches, and 64 feet 10 inches. The reinforced-concrete columns, 20 inches square average size, both support and are an integral part of rigid-frame RC girders that span the width of the structures at 18½-foot intervals.

In turn the rigid frames support precast-concrete roof panels which are covered with conventional built-up material. Vacuum concrete is used in both the floor and roof-slab construction, as well as with the rigid frames. The masonry walls are 14 inches thick, consisting of 4-inch red-face brick, 2-inch cavity, and backed by 8-inch concrete block. Four 12-inch fire walls, also of brick masonry, cross each warehouse to

(Continued on next page)



After the forms are stripped from the reinforced-concrete rigid frames.



The first of the two warehouses in the initial contract as it neared completion. The 200 x 1,000-foot structures have loading platforms on the long sides.

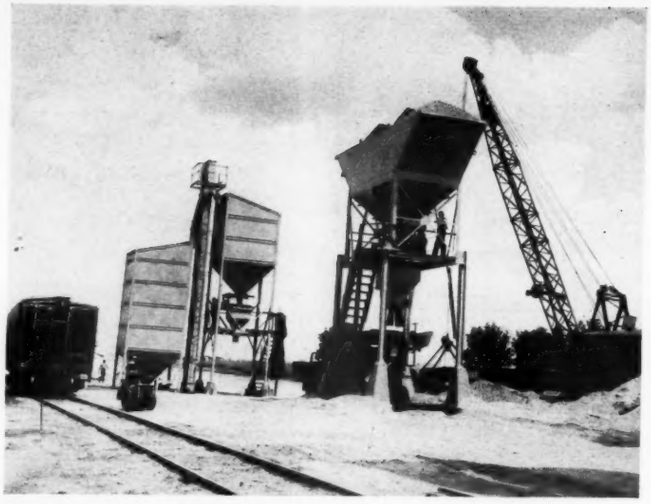
Navy Bureau Builds Seventeen Warehouses

(Continued from preceding page)

divide the length into five sections, each 205 feet 3 inches long, making the total over-all length 1,026 feet 6 inches. Each section has eleven 18½-foot bays running the width of the building.

Digging the Footings

For the ten warehouses, 3,300 individual footings had to be excavated, formed, and filled with concrete. Footings are built at a depth varying from 4 to 12 feet below the warehouse - floor elevation, and average 6½ feet square x 18 inches deep. Stub columns are then built from the footings up to grade, after which the rigid frames—both columns and overhead girder—are poured as one unit.



The batch plant for the casting yard on the first contract consists of this Heltzel aggregate bin and Blaw-Knox cement bins. Truck mixers drive through both in loading.

Digging these thousands of separate footings into the prepared flat terrain, with its 95 per cent compacted soil, presented something of a problem. At first, excavation was handled by the conventional backhoe or crane with clamshell. This developed into a somewhat slow and costly procedure, for the holes were too small for the efficient and economical use of standard excavators. In addition, considerable hand labor was required in cleaning out each hole to neat lines after the backhoe or clamshell had moved on. At times, carpenter crews building footing forms had to be laid off until enough holes were ahead. Consequently the contractor was forced to develop a method for excavating footings along the mass production techniques of an assembly line, rather than to continue to dig out each footing individually.

A new Parsons 250 Trenchliner was put to work digging parallel trenches, 8.8 feet apart out to out, in rows running the length of the warehouses over the lines of the footings. Trenches were 24 inches wide, and varied in depth from 4 to 12 feet below grade. Digging depth was easily controlled by the Trenchliner operator who read the grade required at each footing on stakes that were reached just ahead of the hole location. He then made the simple adjustment to the correct depth of trench required. A profile, if taken along the bottom of the trenches, would show a wavy line, rising slightly between the footings. Cutting through clay, sand, and limerock, the Parsons 250 dug 1,300 linear feet of 10-foot trench in 9 hours of operation. Where only a 4-foot depth was required, the Trenchliner opened up 2,500 feet in the same period of time.

Next a Gradall cut out the center area between the parallel trenches at each footing to such neat lines that costly cleanup hand work was practically eliminated. Backhoe and clamshell were also used on the center cutouts. This operation speeded up the footing work to such an extent that the excavation was soon far ahead of the forming and concrete placing. Wooden forms were dropped cleanly into the trimly cut holes, and the concreting followed in smooth sequence. The 4-sided footing forms, simple and sturdy, were assembled in the carpenter shop. They were secured in place with four steel pins—one driven into each corner of the form. After the concrete had set, the pins were easily pulled with a claw bar, and the footing form was readily removed from the hole.

Footings are 2-way reinforced with steel bars to which are tied four vertical bars. The vertical bars serve as reinforcing for the stub columns, which are in the succeeding pour. Before the stubs are built up to floor grade, cranes set the column steel for the rigid frames. Wooden forms to contain the concrete are then built around the steel, and secured with Richmond ties. A pair of Superior woodworkers in the carpenter shop speeded the form building.

Reinforcing for the job was supplied by Joseph H. Fox & Co., Virginia Steel Co., and Connors Steel Co.—all of Birmingham, Ala. The steel cages were fabricated on

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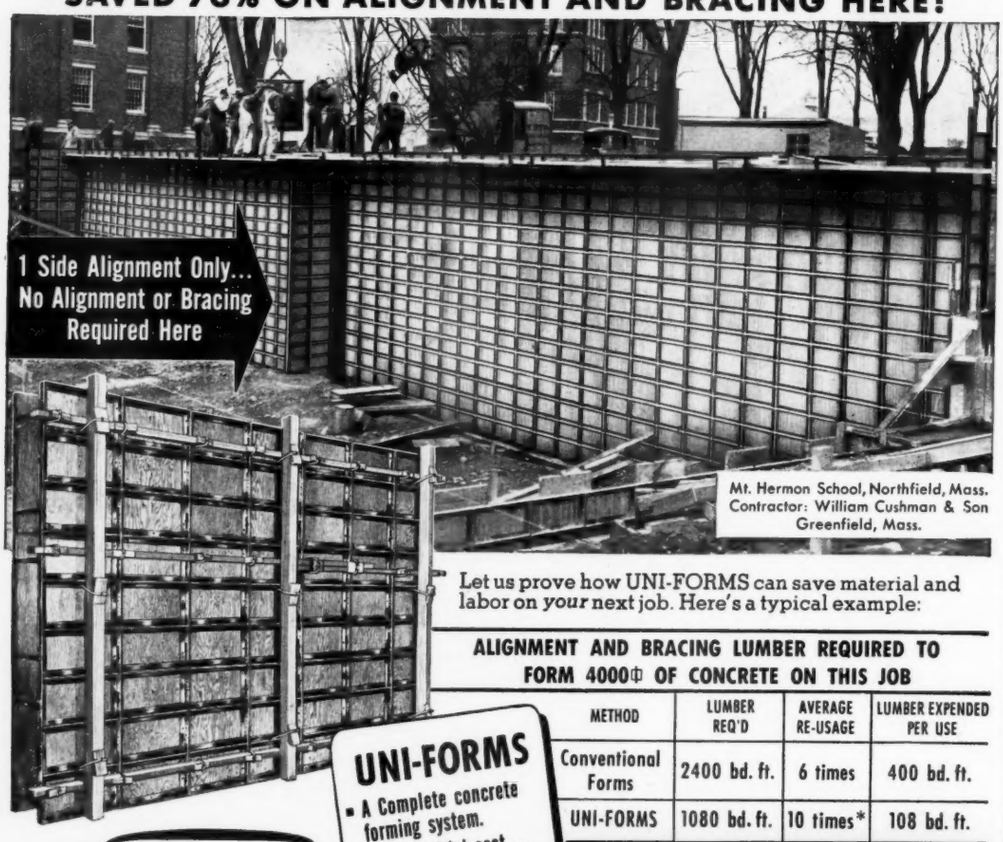

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LUMBER SAVED PER USE . . . 292 bd. ft.
% OF SAVING . . . 73%

*Standard lumber lengths always used with UNI-FORMS—no cutting—no waste.

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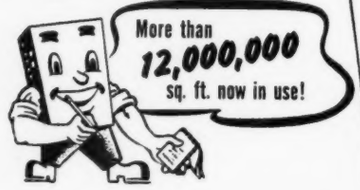

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wooden horses in the contractor's yard, and erected with cranes.

Concrete Plant

Reinforcing steel and concrete for the warehouses required 7,500 tons and 125,000 cubic yards respectively. The concrete item included 17,000 yards for the precast roof slabs. To supply this concrete, the contractor set up a batch plant at one end of the project and not more than a mile from the farthest warehouse. Two complete batching plants, consisting of Heltzel 100-ton aggregate bins and Blaw-Knox 400-barrel bulk-cement storage units, delivered dry batches to transit-mix trucks. The bins were laid out in line so that the truck mixers could drive through in picking up first the aggregate and then the cement. Spur tracks for rail delivery of materials flank both sides of the plant, with the aggregate coming in on one track and bulk cement on the other.

Portland cement is furnished by Lehigh and Lone Star of Birmingham, Ala., and Penn-Dixie of Clinchfield, Ga. Gravel for coarse aggregate comes from Montgomery and Marion, Ala., and from Columbus, Ga. Local pits supply the sand. Two cranes with clamshells charge the storage bins while Hough Payloaders keep the stockpiles in neat shape.

Water for the mix comes from two wells, 210 feet deep, and is pumped out by a 6-inch electric pump with an 8-inch diesel-driven unit as a standby. It is stored in a 5,000-gallon elevated tank that feeds three hydrant outlets where the truck mixers may conveniently tank up. A fleet of 13 Rex 5-yard Moto-Mixers on Diamond T trucks supply the concrete. Batches are mixed 2 minutes per yard of concrete.

Concrete Placing

Footings of course were poured first, with the concrete chuted directly into the forms from the truck mixers. Both Vibro-Plus and Master vibrators were available to vibrate the concrete as it was placed. The stub columns, from the footings up to ground level, were poured next. Forms were assembled in 2, 4, and 6-foot sections to provide quickly any height desired. Again the concrete was placed via the chute from mixer to forms. Forms were used over and over since the column sizes were well standardized—20-inch square for the interior columns and 20 x 24-inch for the exterior columns. Hunt Process was used throughout for curing all concrete.

All underground pipes and conduits serving the warehouses were installed in advance of the floor-slab construction. Great care was exercised in placing backfill to attain the original 95 per cent compaction. Tamping units for mass compaction around the footings were introduced, such as a battery of six Schramm pneumatic tampers that were assembled on a single frame—three on each side of a supporting I-beam. This heavy unit was suspended from the load line of a crane, and was guided by a crew of three.

Over the compacted fill is laid the 7-inch RC floor slab. These floor slabs were poured in alternate 30-foot sections, following the procedures used on a concrete paving job to speed the work.

Compacting backfill around a column with a battery of six Schramm pneumatic tampers assembled into one unit. The rig is supported on the load line of a crane.

Precast Roof Panels

By the middle of last summer construction of the roof slabs or panels got under way at the casting yard adjoining the batch plants. A total of 26,400 panels are required, each measuring 18 feet 5¾ inches long x 4 feet 11¾ inches wide x 1¼ inches thick. An integral joist 8 inches deep forms each side of each panel and approximately every 4 feet along each panel is a rib 6 inches deep. To cast these trough-shaped thin-shell roof panels, the contractor built 140 forms, roughly 5 x 19 feet. These forms or molds are also made of concrete.

With the facilities at the batching plant and casting yard working smoothly, the contractor was able to place up to 100 yards of concrete an hour. The mix for the roof panels

(Concluded on next page)

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Navy Bureau Builds Seventeen Warehouses

(Continued from preceding page)

was designed to have a strength of 4,000 psi at 28 days; for the floor slabs and rigid frames 3,000 psi concrete sufficed. Production was interrupted only when construction of the rigid frames could not keep pace with the panels being turned out. The truck mixers delivered the concrete to hoppers on tracks, and from there it was chuted into the forms. Four Scoot-Cretes also helped in the placing of the concrete.

Vacuum Concrete process is used in precasting the roof panels, also in the cast-in-place floor slabs and rigid frames. The technique consists essentially of creating a high vacuum within suction mats in contact with the concrete surface of the structure. The portable suction mats or pads by which the vacuum process is applied measure 3 x 4 feet. Three Fuller pumps developing a 20-inch vacuum are employed to remove excess water in this process. This results in a no-slump consistency, and a closing up of the water voids.

Panels are stripped from the molds after about 20 hours by means of a vacuum lifter handled by a crane with a 70-foot boom and a 20-foot jib. They are loaded on straddle trucks for hauling to the warehouses under construction. Again the vacuum lifting process is used for setting the panels between the rigid frames. A pair of Hyster Yardmasters were employed at the casting yard for moving materials and supplies. Vaccum Concrete, Inc., of Philadelphia, Pa., assisted the contractor with the basic planning of the casting yard, and with field-construction details of the vacuum-concrete operations.

Rigid Frames

As the stub columns are completed to grade and backfilled, truck cranes, such as a Lorain Moto-Crane with a 30-foot boom and a 15-foot jib, begin erecting the steel cages for the columns proper. The reinforcing assemblies are inverted L shapes for the outside rows of columns, with the upper horizontal portion designed to tie in to the girder of the rigid frames. Thus the steel extends continuously from the footing to the roof.

These rigid frames, spaced 18½ feet on centers, are 200 feet long, 20 inches wide, and with a depth varying from 30 inches at the center to 60 inches at the interior columns. They are 25 to 27 feet above the floor level. Trusses resting on timber falsework are used to bear the weight of the steel cages, forms, and concrete until the rigid frames are self-supporting. Cages are assembled on the ground, and erected after the beam bottoms are in position. Concrete is placed with cranes and buckets. Beams and columns are poured together as a monolithic rigid frame.

Side forms along the beams or girders are removed about 3 hours after a pour and the concrete is vacuum-processed on both sides. This permitted a much earlier stripping of the bottom forms and the removal of the supporting trusses, usually when the concrete had attained three-quarters of its final strength. Beam forms have steel bottoms but wooden sides into which the vacuum mats are incorporated.

Well Organized Job

The big job, employing approximately 1,000 at the peak of construction, was so well organized that all operations were being carried on at one phase of the project. Work was divided into five basic crews: (1) grading, excavating, and backfilling for foundation footings; (2) forming and concreting up to floor level; (3) construction of rigid frames; (4) batch plant and precasting yard; (5) masonry work.

As the rigid frames were completed and the precast panels set in place, the pitched roofs were covered with 2 inches of insulation and typical built-up bonded roofing material. On each side the roof comes down to form canopies over loading docks; there is a railroad siding on one side of each warehouse and a road for trucks along the other side.

The masonry laying consisted of 3,085,000 pieces of jumbo brick and 600,000 concrete blocks, or the equivalent of a wall 6 miles long x 21 feet high. The warehouses are equipped with overhead steel doors, steel sash windows, roof ventilators, and modern lighting.

Grannis & Sloan, Thompson, Street, & Wattinger Co. is represented by J. L. Padgett, Project Manager.

In addition, a contract for seven more of the large warehouses was let in October, 1952, to Batson-Cook Co., of West Point, Ga., making a total of seventeen of these enormous warehouses under construction at one time. The vacuum-concrete process is also being used on this later contract. Batson-Cook Co. has its own casting yard and batch plant. Mandel Leder is field representative for Vacuum Concrete, Inc., on both contracts.

Design and construction of the U. S. Marine Corps Depot of Supplies, Albany, Ga., is under the supervision of Commander J. A. Dominy, CEC, U. S. Navy, who is Resident Officer in Charge, Bureau of Yards and Docks Contracts. Captain S. P. Zola (CEC) U. S. Navy, District Public Works Officer 6th Naval District is the Officer in Charge of Construction.

Flanders Is Manager

Lloyd E. Flanders has been appointed Sales Manager and Assistant General Manager of Maginniss Power Tool Co., Mansfield, Ohio, manufacturer of Hi-lectric concrete vibrators, generators, and other construction tools.

. . . makes self-powered moves Parsons rubber-tired 88 Trenchmobile drives anywhere at road speeds up to 12.6 m.p.h. . . . no waiting for trailer, loading or unloading delays. It maintains fast "work-and-run" schedules . . . a job 6 miles away can be started in less than 30 minutes from "now".

Digs up to 20 ft. per minute . . . 8 or 12 in. wide, in depths to 5 feet . . . gives you low-cost, one-man trenching on gas and water mains, off-street service connections, pipe reclamation, underground cables, lighting and sprinkling systems, foundation footings, etc.

Undercuts sidewalks, curbs, gutters, mains With reverse traction and sloping ladder boom, Trenchmobile handles undercutting, makes vertical set-ins flush with foundations, saves hand clean-up. Hinged crumber swings up, out of the way. Positive down crowd on boom starts cut fast, maintains grade in hard soils.

Shock-load protection . . . Dual-purpose friction clutch automatically protects all machinery against shock loads and drives the bucket line. Buckets are high-carbon cast steel . . . and have self-sharpening, easy-in, easy-out "Tap-In" teeth that maintain maximum digging efficiency under all soil and job conditions.

Controlled discharge . . . shiftable, reversible belt conveyor discharges spoil to either side of machine, dodges walls, poles and other side obstructions without swerving from trench line. Discharge height remains constant regardless of digging boom depth.

Hydraulically-controlled backfill blade (optional) doubles Trenchmobile usefulness, lets you handle the entire job of trenching and backfilling with one-man and one-machine economy.

On your work, all these Trenchmobile advantages can mean more jobs completed per day at lower cost, with less supervision . . . and more profit for you. It will pay you to get all the details on this 43.6 h.p., rubber-tired 88 Trenchmobile from your Parsons distributor . . . or send for bulletin. Also check Parsons 5 big heavy-duty Trenchliners®, wheel and ladder types, full crawler mounted, for constant savings on major trenching jobs.

CP2002 C&E

Send for Trenchmobile bulletin

to: PARSONS COMPANY, Newton, Iowa

NAME_____

COMPANY_____

STREET_____

CITY, STATE_____

PARSONS

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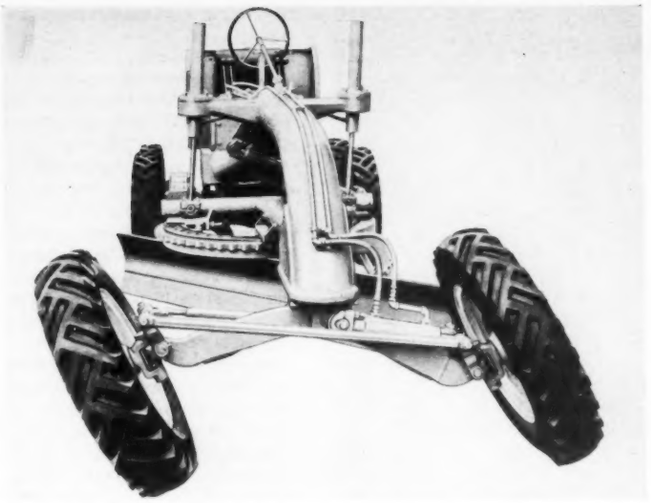
(Koehring Subsidiary)

Motor Grader Gets Front-Wheel Lean

Front-wheel lean and power-circle turn are now offered as optional equipment for the Allis-Chalmers 40-hp tandem-drive Model D motor grader. The wheels lean 25 degrees each way, which is said to be an ample range for ditching and for counteracting side draft. New mechanisms for the front-wheel lean include axle and steering knuckles, additional tie bar, and wheel-lean cylinder. Axle tilt is 15 degrees.

Wheels are leaned by moving the valve-control lever. When the control is in neutral position the wheels stay in position any place in the 50-degree range. No locks are required. Blade maneuverability is increased because the front of the grader can be moved over more than a foot by leaning the wheels.

The circle turn provides precision control with a wide range of settings through 135 degrees. When finishing subgrade or blacktop, the moldboard can be rotated without disturbing the road surface. The toe of the blade can be swung well inside the front tire to give sufficient range for ditching. The power-circle turn is operated by a hydraulic motor and reduction gear and includes a new circle. Self-cleaning teeth are mounted on the outside of the circle, and self-locking reduction gears are used.



The front wheels of the Model D grader lean 25 degrees each way. Optional equipment is available from Allis-Chalmers Co.

Other equipment for the Model D includes rear-mounted loader, windrow eliminator, shoulder maintenance blade, hydraulically controlled scarifier, V-type snow plow, and accessories such as completely enclosed cab, windshield wiper, heater, defroster fan, radiator fan, radiator shutter, hour meter, horn, special front-tire equipment; and special moldboard equipment.

For further information write to the Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 91.

WASHO Road Test for 1953

The Highway Research Board at a recent meeting of the Advisory Committee for its WASHO Road Test, announced the continuation and schedule for operation of the test for this year. (See C. & E., Feb., 1953, pg. 52.)

The project, located between Ogden, Utah, and Pocatello, Idaho, was begun last summer and test sections were subjected to about 17,000 heavy-axle loads during this past fall.

Testing this year will consist of studies of deflections in the pavement under various axle loads and axle-load combinations. These studies will be repeated twice. At the conclusion of the third series of deflection tests, regular 2-shift operations with the full test loads will be resumed.

Regular test traffic, consisting of 18,000 to 22,400-pound single-axle loads on one test loop, and 32,000 and 40,000-pound tandem-axle loads on another, will operate 18 hours per day, 6 days per week, through the summer and continuing into the fall, until such time as the pavement structure is frozen.

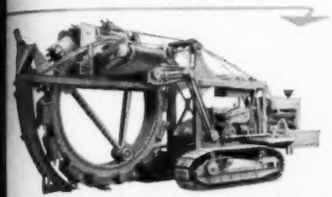
New Hose Fitting

A new hose fitting is made by the Aeroquip Corp., 303 S. East Ave., Jackson, Mich. The manufacturer points out that the Little Gem fitting clamps only the reinforcing braid of the hose and separates the inner tube from the braid to make a lip seal. The hose-end needs no preliminary preparation.

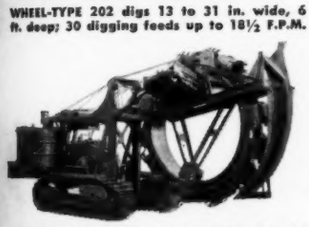
The main advantage of the fitting, according to the manufacturer, lies in the reduction of compression of the rubber inner tube. Rubber-like materials tend to take on a definite set under extreme compression and also tend to flow away from the zone of compression. This action is accelerated by heat. The new fitting is said to avoid this condition thus increasing hose life.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 126.

Check work capacity of these 5 Parsons TRENCHLINERS . . .

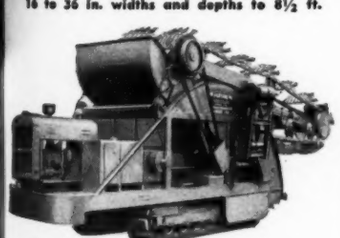


WHEEL-TYPE 202 digs 13 to 31 in. wide, 6 ft. deep; 30 digging feeds up to 18½ F.P.M.



CROSS-COUNTRY 215 WHEEL-TYPE digs 13 to 31 in. wide, 6 ft. deep, up to 18½ F.P.M.

LADDER-TYPE 221 digs up to 13¾ F.P.M., in 16 to 36 in. widths and depths to 8½ ft.



LADDER-TYPE 250 has 16 to 42-in. widths, digs 12½ ft. deep; 30 feeds to 9¾ F.P.M.

HIGH-CAPACITY 310 with single boom digs 18 to 54-in. wide, 17 ft. deep . . . with dual booms it digs 72 in. wide, 12 ft. deep . . . has 45 feeds from 8 in. to 153½ ft. per min.

PARSONS

LOAD 1500 LBS. in Kwik-Mix Moto-Bug®

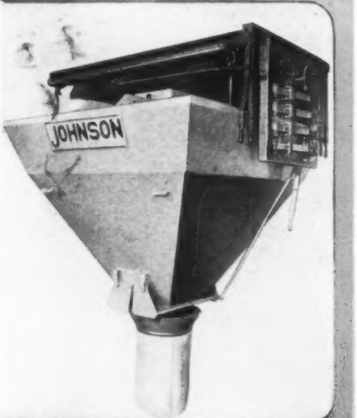
This low-cost power wheelbarrow, with 10 cu. ft. (struck) hopper, has a 1500-lb. load-carrying capacity . . . climbs 20% ramps fully loaded with operator riding on rear step. Hopper has instant gravity dump with snub-line control. There's full power forward and reverse . . . no push, no pull necessary. 3.6-to-1 gear ratio on large steering wheel gives effortless maneuvering. Interchangeable units: flat bed, 5-foot fork lift, scraper.

KWIK-MIX (Koehring Subsidiary)
Port Washington, Wis.

2, 3 or 4-material Johnson "Hi-Speed" Batchers

. . . are "Hi-Speed" because extra wide, 15"x36", fill valves and wide bin top openings reduce charging time . . . steep side slopes give fast, clean discharge. Standard batcher handles 34-E paver batch. For charging truck mixers, 4 material "Hi-Speed" Batcher can be furnished with 2, 3 or 4-yd. weigh hoppers having double clam discharge gate and collector ring. Also check the complete Johnson line of mix plants, bins, buckets and silos.

C. S. JOHNSON (Koehring Subsidiary)
Champaign, Ill.



MORE WORK-TIME with Koehring HALF-YARD

There's no time-out for continuous manual clutch adjustments . . . no "compromise" settings with this Koehring heavy duty ½-yard. All main clutches are self-adjusting . . . heat-compensator springs make tension changes automatically. This maintains big yardage performance with shovel, hoe and dragline, is equally important on intermittent usage of crane and clamshell work. 3 larger sizes up to 2½ yds., cranes to 79½ tons.

KOEHRING COMPANY
Milwaukee 16, Wis. V62

Preparing the grade for a railroad track with a Bucyrus-Erie B-170 scraper pulled by an International TD-24.

Marines' Supply Depot—Preparing the Site

(*Continued from page 37*)

trestles and three highway bridges spanning the big ditch. To prevent erosion the slopes of the long ditch were sprigged. Large underground reinforced-concrete drains, from 15 to 96 inches in diameter, feed the drainage ditch. These drains total 41,000 linear feet.

A sanitary sewer of vitrified clay pipe, 24 to 30 inches in diameter, was also laid parallel to the big ditch. This line ends at a sewage-treatment plant now under construction.

Big Grading Job

While the site is fairly flat, nearly 2,000,000 yards of grading was involved in these initial contracts. The bulk of the dirt-moving was concentrated over only 80 acres of the large tract, and the deepest cut required was 12 feet and the maximum fill was 9 feet. In general, cuts and fills averaged from 3 to 5 feet. Two large limestone "sinks", where surface water settled, were filled in, requiring nearly 500,000 yards of material. Shops eventually will be built over what was once a large depression in the terrain. Wherever a structure was called for on the plans, fills in that area were placed in 6-inch lifts and compacted to 95 per cent at optimum moisture.

During the grading, trees were safeguarded wherever possible, and only those in the path of future roads, railroads, drains, or buildings were removed. Topsoil was stockpiled for use later in landscaping. Dirt at the site was mostly sand-clay near the surface with a stratum of clay below that. Lime rock underlies most of the area. All material needed to complete the fills was obtained within the site area, and favorable balances were obtained between cuts and fills.

At the peak of the grading operations last year, the contractor's dirt-moving equipment for hauls up to 2,000 feet included 6 Wooldridge Terra Cobras and 9 Caterpillar DW10 scrapers. Short-haul dirt moving, up to 800 feet in length, was handled by tractor-scraper combinations that included 4 Bucyrus-Erie B-170 scrapers and 3 LeTourneau LP Carryalls. The B-170's were pulled by International TD-24 crawlers, while D8's pulled the LP units. Other tractors used as pushers in loading the scrapers, dozing, or for pulling rollers included two TD-24's, four TD-18A's, a TD-14A, seven D8's, and a D7.

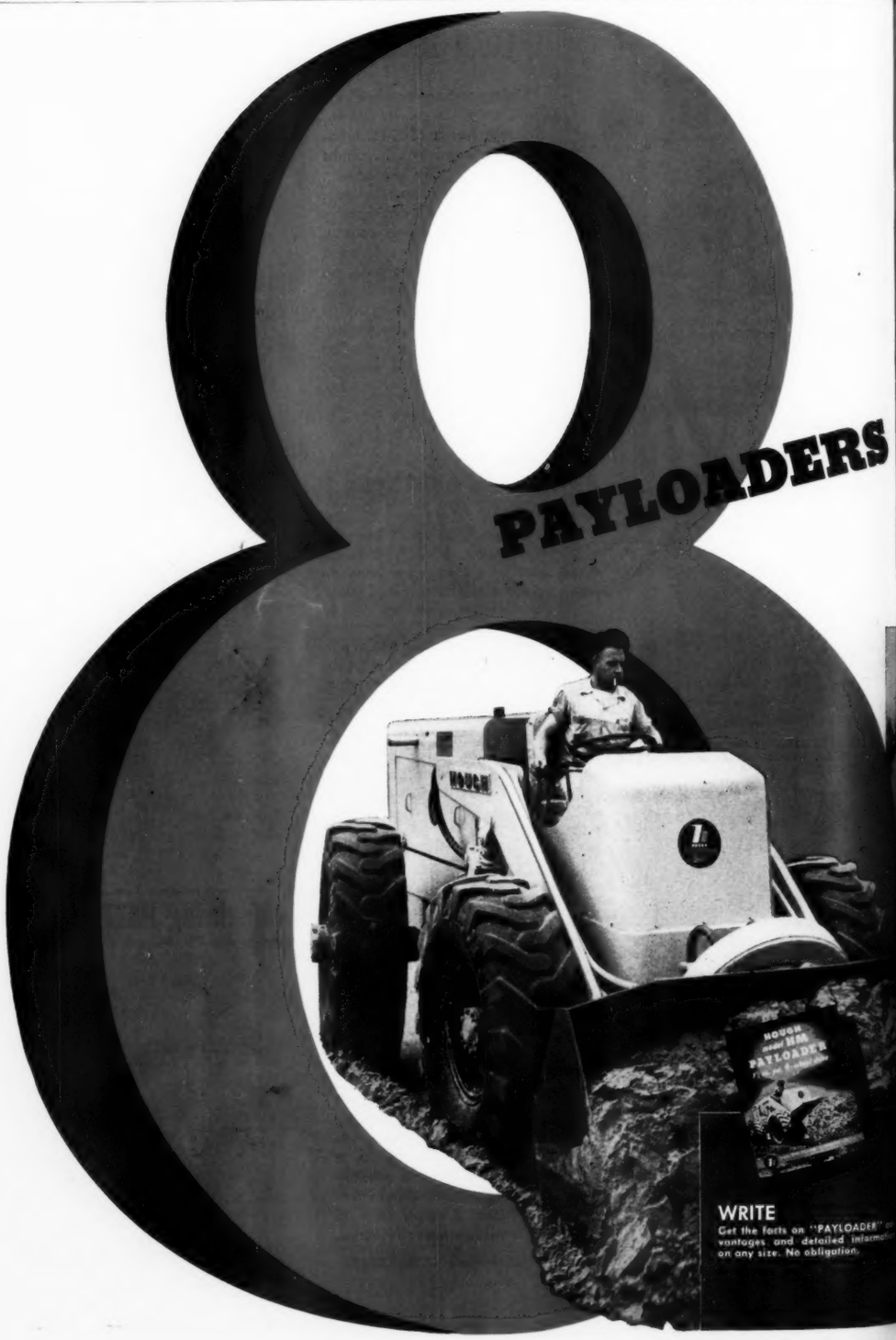
The 95 per cent compaction was achieved with a Bros 50-ton straight-wheel pneumatic-tire roller, and Grace dual-drum tamping rollers. Tank trucks of 1,200-gallon capacity sprayed water on the fills to maintain the 13 to 15 per cent moisture content which was the optimum required for specified compaction.

A patrol road around the perimeter of the field was built by the Marines themselves, using their own equipment, which included a TD-24 dozer, two TD-18A's, and a TD-14A tractor with Bucyrus-Erie scrapers.

Water Supply

Water for the depot comes from three wells averaging 1,000 feet deep and producing 1,500 gpm. It is stored in two 500,000-gallon elevated

Comdr. J. A. Dominy, CEC, USN (left), Resident Officer in Charge of Construction, with Lt. Comdr. T. H. Graham, his assistant.



tanks which were erected by the R. D. Cole Manufacturing Co., of Newnan, Ga.

The administration area for the depot is near the center of the tract, while the warehouses are being erected at the west end. Barracks and the housing center are located in the eastern sector.

Design and construction at the Marine Corps Depot of Supplies is under the supervision of Commander J. A. Dominy, CEC, U. S. Navy. Resident Officer in Charge. Captain S. P. Zola, CEC, U. S. Navy, District Public Works Officer, 6th Naval District, is the Officer in Charge of Construction.

The architect and engineer for this project is the associated firm of Dunwoody, MacEwen, Hall & Ferguson of Macon, Ga., and the J. E. Greiner Co., Baltimore, Md.

Remember—Safety Is No Accident!

Concrete Boxes Make A 750-Foot Wharf

An important part of the Aluminum Co. of Canada's huge new aluminum-smelter project at Kitimat, British Columbia (see C. & E., Jan., 1953, pg. 24) is a wharf at which ocean steamers bringing aluminum from Jamaica can dock. The new wharf, now under construction by Kitimat Constructors, Ltd., under the supervision of Frederic R. Harris, Inc., consulting engineer, is to be 750 feet long. It will consist of three cellular-concrete caissons or boxes—a construction which already exists in Montreal harbor and many other foreign ports.

The method of constructing these concrete boxes, however, is unique. A basin is being dredged out of the beach, near the plant site on the Kitimat Arm, with its bottom a few feet below low tide. Inside the basin, which will be totally enclosed with an earth dam, the boxes will be built on their sides with the least dimension as the vertical. The dimensions of each box in final position will be 65 feet high, 45 feet wide, and 250 feet long. The three boxes comprising the full 750-foot length of the wharf will be built simultaneously in one basin.

This aerial view of the dock construction at Alcan's new aluminum smelter at Kitimat, B. C., shows the outline of excavation, an access road into the dock at the northeast corner, and shovels handling the base material.

On completion of these boxes, the surrounding dike will be broken and the basin flooded at high tide. The boxes will be floated out, one at a time, to deeper water; they will not touch bottom at the lowering of the tide, which varies by 20 feet. After they are afloat, the boxes will be careened through 90 degrees by adding ballast at one end to float them in normal upright position. They will then be towed to the wharf site where additional ballast will be added to set them on the bottom in final position. Once in this position, they will be entirely filled with gravel and stone with fill placed behind, thus completing the wharf. A warehouse and crane will be built on the wharf and railroad tracks will be placed to handle the loading and unloading equipment.

The decision to build the concrete boxes on their sides and put them through a careening operation was based on economic considerations. The basin is a very shallow one, and the draft of the boxes afloat in their flat position is less than their draft in the final upright position.

Bucket-Type Earth Drill

A folder on a bucket-type earth drill is available from the California Welding & Blacksmith Shop, Inc., 7222 East Slauson Ave., Los Angeles 22, Calif. The unit drills holes up to 200 feet deep and is recommended by the manufacturer for boring caisson pier holes, pre-boring concrete piles, digging belled footings, drilling water wells and cesspools, and testing soil conditions. The Calweld drill is made in 3 models, which can be mounted on a commercial truck from 1 to 2 tons or over.

Interchangeable buckets and a side-reamer attachment permit boring in various types of soil. One-man control raises the derrick, lowers the drill, lifts the bucket, and powers the drill. The bucket is unloaded by a hand-tripping operation. All controls are centered in a single unit.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No 90.

there's a PAYLOADER® size for every size job!

Big jobs . . . small jobs, they're all the same to a "PAYLOADER" because there are eight sizes of these unusual tractor shovels. "PAYLOADERS" are *basic* equipment for many jobs . . . auxiliary equipment on most any project. You have a choice of four-wheel-drive, rear-wheel-drive or front-wheel-drive to best fit your needs and *every* "PAYLOADER" model is thoroughly field-proven

Every "PAYLOADER" has many distinct, valuable features "built-in": multiple *faster* reverse speeds; proper weight distribution; operator location for utmost visibility. They all have automatic bucket crowding action and automatic tip-back bucket that makes operation faster and easier. And "PAYLOADER" design is rugged, simple and accessible to insure long life and low maintenance. "PAYLOADER" Distributors — some 200-strong in the U.S. and Canada — are ready to serve you with their modern parts departments and service shops manned by experienced personnel.

Yes, when you want a *real* tractor-shovel, get a "PAYLOADER" — a *complete* unit built by the tractor-shovel pioneer, The Frank G. Hough Co., 762 Sunnyside Avenue, Libertyville, Illinois.

MODEL HA — ½ cu. yd. front-wheel-drive
MODEL HAH — ½ cu. yd. front-wheel-drive
MODEL HE — ½ cu. yd. rear-wheel-drive
MODEL HF — ¾ cu. yd. rear-wheel-drive gas or diesel
MODEL HFH — 1 ⅛ cu. yd. rear-wheel-drive extra-high lift gas or diesel
MODEL HY — 1 ¼ cu. yd. rear-wheel-drive gas or diesel
MODEL HR — 1 cu. yd. four-wheel-drive gas or diesel
MODEL HM — 1 ½ cu. yd. four-wheel-drive gas or diesel

HOUGH PAYLOADER®
THE FRANK G. HOUGH CO. • Since 1920

Units Self-Load On Folding-Ramp Trailer

A new trailer unfolds to form its own loading ramp and up to 75-ton units are run onto its platform under their own power. A winch-equipped truck lifts the folding neck and the load is ready to go.

The Martin F075M folding gooseneck trailer has a low platform for load stability in transit. At the destination the load may be run off the trailer as the ramp again unfolds.

The trailer has a 12 x 24-foot platform, with an over-all length of 43 feet. It rolls on sixteen 11.00 x 20 12-ply tires, mounted on multiple oscillating trunnions. Single and tandem-axle models with capacities from 12 to 100 tons are available.

For further information write to the Martin Machine Co., Kewanee, Ill., or use the Request Card at page 18. Circle No. 25.

New All-Wood Truck Bodies

At a ceremony at the Pentagon in March, three modern all-wood Army truck bodies were presented by the lumber industry to the U. S. Army Ordnance Corps.

The truck bodies, each of a different type and embodying the latest developments in wood technology, were designed and built at the laboratory of Timber Engineering Co., research affiliate of the National Lumber Manufacturers Association, in cooperation with officials of the Ordnance Corps and the Corps of Engineers. The truck bodies are the result of 5 years' research at the Teco laboratory, and are said to depart radically from traditional methods of construction.

Teco's director of research, Carl A. Rishell, spoke of the innovations brought to their design. Col. J. A. Barclay, accepting the trucks on behalf of Maj. Gen. E. L. Ford, Chief of Ordnance, commended the lumber industry for its efforts toward national preparedness and emphasized the importance of industrial research in providing the needs of the men in the field.

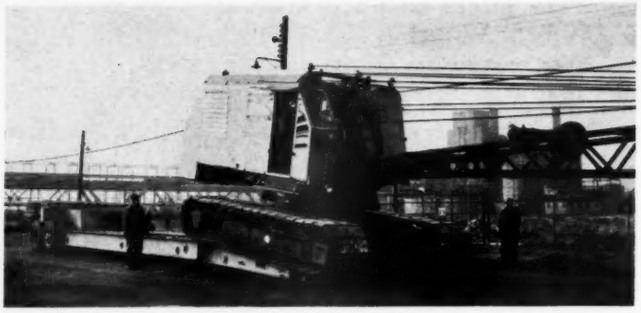
A large number of commercial truck manufacturers and high government and military officials attended the ceremony, and showed considerable interest in these latest developments in mass-production design for motor vehicles.

Crawler-Mounted Crane

A booklet on a crawler-mounted crane which can be converted for dragline, clamshell and pile-driver work is available from Osgood General, Marion, Ohio. The air-operated Model 1007 has a 3-piece 75-foot lattice-type boom. Inserts of 5 to 20 feet can be added. One, 2, and 3-sheave boom points are interchangeable for different units of service. A third drum unit is available for special crane or pile-driving service.

Air power is controlled by metering valves adjusted by throw levers on the control panel to deliver the right amount of air power for each operation and allow the operator to retain the feel of his load.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 86.



A crane mounts the folding ramp of the Martin F075M trailer under its own power to save loading time. At the destination the ramp will fold down to allow the unit to unload.

Tubing for Concrete

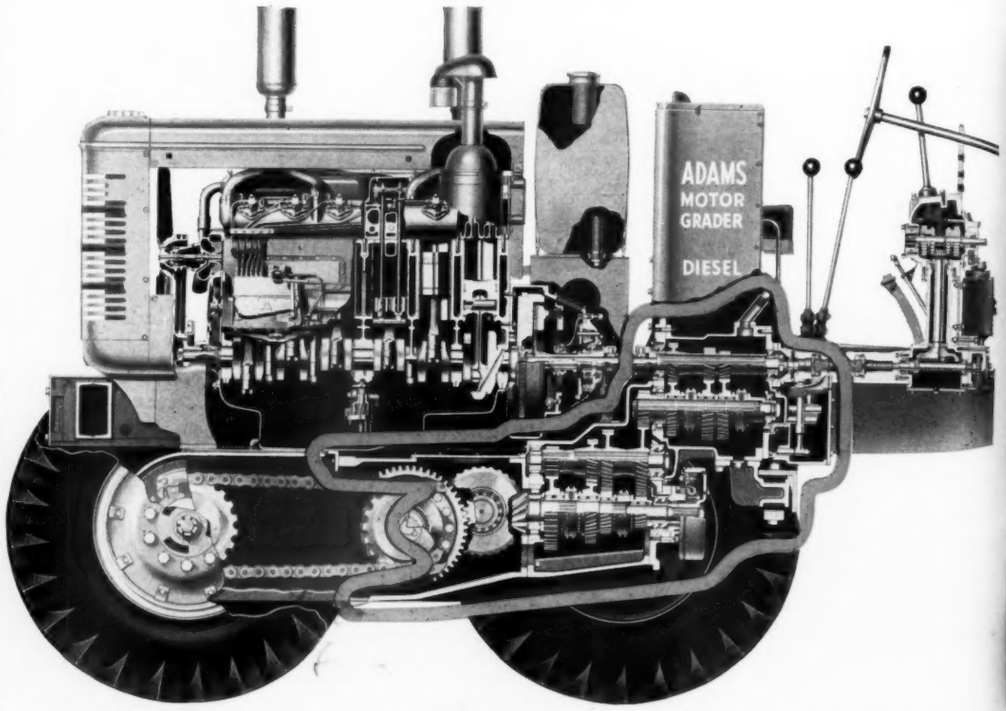
A folder on plastic split tubing used over wire rope in post-tensioned beams of prestressed concrete is available from Anchor Plastics Co., Inc., 36-36 36th St., Long Island City 6, N. Y. The Aeroflex tubing prevents the steel strands from bonding with the concrete, and keeps the concrete out of the interstices between the wires. The folder shows how the tubing is applied and contains a list of some of the sizes.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 76.

Handles Super Slugger

Tempo Products Co., Cleveland, Ohio, will now handle all sales for Super Slugger electric hammers and Super Slugger tools, manufactured by Noble & Stanton, Inc., Bedford, Ohio.

Tempo Products Co., headed by John R. Kaiser, has representatives in all principal industrial areas of the country. The company is well-known as a pioneer in the field of powder-actuated fastening and anchoring tools and equipment. Robert R. Elliott is Sales Manager.



Adams Offers New Constant-Mesh Transmission

Features Helical Gears, Anti-Friction Bearings Throughout and Creeper Gear Option

All Adams 100 h.p. motor graders now feature a new Adams-built constant-mesh transmission and a new final drive which have more operating advantages, more quality and longer life built into them than ever before put into any motor grader.

All transmission gears (excepting low) are helical and are shaved and hardened for quietness, maximum tooth contact and long life. All free-running gears turn on roller bearings. Gear shifting is easy and positive due to direct connection between shift levers and transmission. The final drive has the full-floating rear axle which characterizes all Adams motor graders. All gears, shafts, bearings, housings, etc. throughout transmission and final drive are built with a safe margin of strength and durability.

8 Forward and 4 Reverse Speeds

The new transmission has 8 forward speeds found in all Adams motor graders furnishing a wide range of operating speeds plus a high transport speed of 25 to 26 m.p.h. New are 4 reverse speeds, ranging from approximately 1½ to 13½ m.p.h. which save time on contract work and backing to buck snow drifts.

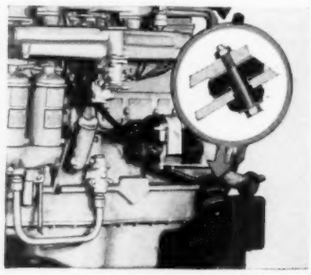
Creeper Gears New Optional Feature

To permit extra-low speeds, desirable on some work, the new Adams transmission is designed to accommodate "creeper" gears which provide 3 speeds ranging from approximately ¼ m.p.h. to 1¾ m.p.h. These are in addition to the standard 8 forward speeds. The "creeper" gears may be ordered as original equipment or may be installed at any time in the field at nominal cost.

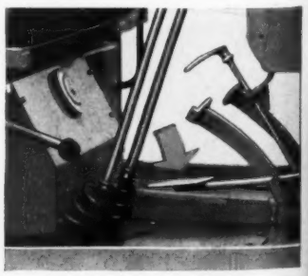
Dual Braking System Standard

The transmission has an external brake with internal expanding shoes which are actuated by the service brake pedal through the same hydraulic system which operates the wheel brakes. Braking efficiency is practically doubled. The same brake serves as a parking brake when set mechanically by parking brake lever.

New Transmission Also Brings These Improvements



Engines are rubber-mounted. Engine vibration is not transmitted to grader frame or operator's cab. This reduces operator fatigue and prolongs engine life.



Foot accelerator permits operator to regulate travel speed as with a truck. Valuable in traffic or overland travel. Operator uses accelerator or hand throttle when working.

No Thirsty Motorists On Ohio's Roads

The Ohio Department of Highways seems to be of opinion that a motorist will not appreciate the excellence of the roads along which he drives if he is hot and tired and all he wants is a cool drink of water. The Department's Roadside Improvement Section, in pursuit of a way to satisfy this common desire, has for years searched for a hand pump from which a sanitary drink of water could be had without the use of a drinking cup. Three years ago such a pump was found. It was tested, modifications were made, and now nearly 300 roadside parks and other parks in the state are equipped with it.

The furnishing of drinking cups was never within the Department's budget, and drinking from the hand was frowned upon by the Ohio Department of Health. A drinking-fountain type of pump was the obvious answer. The pump decided upon is made by Baker Mfg. Co., Evansville, Wis. It is a well hand pump, as can be seen in the accompanying picture.

"One for the Road." A motorist takes time off for a cool drink on U. S. 30 in Ohio.

The pumps have been accepted by the traveling public with enthusiasm, the maintenance has been nil, and the Ohio Department of Health approves them wholeheartedly.

South Side Terminal Plan For Chicago Is Published

First impressions are important, and the Chicago Plan Commission believes that this rule holds good where cities are concerned as well as people. A visitor to a new city is going to be influenced by the railway terminal at which he arrives. Therefore, reasons the Commission, this should be made as pleasing as possible. Only foresight and orderly planning will overcome the defects inherent in such outmoded and shabby passenger stations as still exist in the Chicago area south of the Loop.

The Chicago Plan Commission has published a 39-page illustrated booklet setting out its recommendations for a consolidated South Side passenger terminal to be built on a site extending from Clark Street to the Chicago River and from Congress Expressway to 18th Street. The land required is owned and occupied by the LaSalle and Grand Central station groups, with the exception of 5 acres of privately owned property at Sharman and Wells Streets. Its public approaches from all directions make this site a focal point for all of the South Side railroads, and the terminal will remain a consolidated station in fact, regardless of what future changes in routes of entry may come about.

"South Side Consolidated Railroad Passenger Terminal for Chicago" was submitted to the City Council Committee on Railway Terminals by the Plan Commission's Chairman, William M. Spencer. Roy E. Olin, Chairman of the City Council Committee, has now released this report, accompanied by a note addressed to the people of Chicago, expressing his hope that the railroads involved will join in bringing the plan to fulfillment. Copies of the report are available from the City Council Committee on Railway Terminals, 188 W. Randolph St., Chicago, Ill.

Distributor and Spraybar

A bituminous distributor is shown in a folder from the General Steel Tank Co., P. O. Box 552, Birmingham 1, Ala. The Cartwright Precision distributor features a side-mounted engine placed ahead of the right rear wheels. This allows the tank to be close to the cab and eliminates excessive overhung weight in the rear.

The unit has a Ford 120 four-cylinder 24-hp engine and a 4-speed transmission. A Roper 4-inch gear-type pump circulates the material.

According to the manufacturer, the nozzles and extensions of the spraybar get hot from the forced circulation of hot material without the use of a torch. Cross-section sketches in the folder show how various parts of the apparatus work.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 127.

Contractor Praises

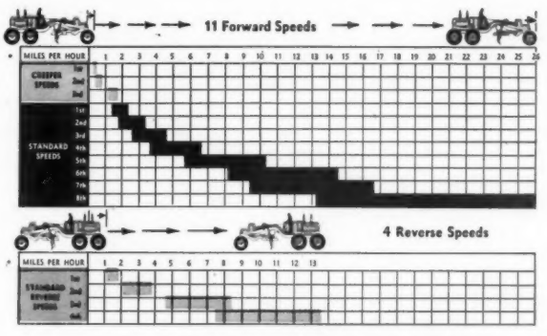
ADAMS Motor Graders

with New Constant-Mesh Transmission

The Missouri Petroleum Products Co. of St. Louis are black-top contractors. Recently they put four 100 h.p. Adams Motor Graders with the new Adams transmission to work on scarifying old asphaltic concrete pavements and mixing and laying oil mat as pictured above. Mr. S. A. Whitmore, Const. Supt. is enthusiastic about their performance—their wide range of speeds—the high reverse speed and the fast transport speed. Further he says "they have more power and traction; will push larger windrows at higher speed which results in more work per day."

Ask your local Adams dealer to show you one of these new, powerful machines. Phone him today.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.



Charts above show the range of Adams 8 forward speeds and 4 reverse speeds which are standard in the new Adams constant-mesh transmission. At top are shown the 3 "creeper" speeds which are optional.

Make your next motor grader an ADAMS

HERE'S A FASTER, EASIER, CHEAPER WAY
TO HANDLE MORE DIRT, ROCK OR GRAVEL!
OMAHA STANDARD TRAILERS

The OMAHA STANDARD "CENTER DUMP" Trailer . . .

. . . Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

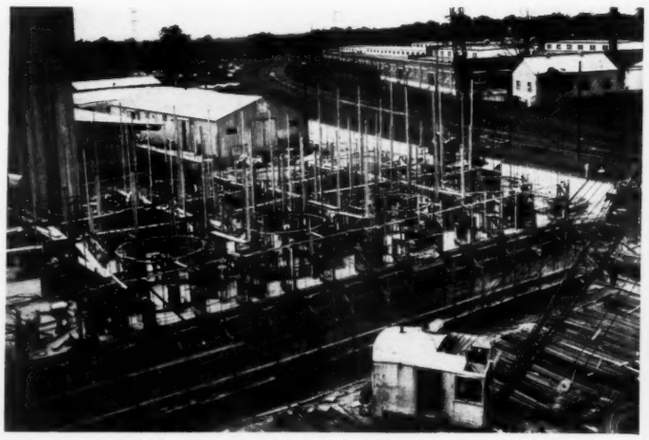
★ Each unit built to job requirements.
★ Available in sizes and lengths to meet all bridge and axle laws.
★ All *steel welded* body, chassis. Built to withstand roughest loading, toughest service.
★ Dumping mechanism FOOL-proof—trouble-FREE!
★ Release on doors INSTANT, SHOCK-PROOF, protected from material flow.
★ DOOR OPENING Meter control that can be *pre-set*.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today Dept. A

OMAHA STANDARD FACTORY & GENERAL OFFICES
2411 West Broadway Council Bluffs, Iowa

Sliding Forms Used In Paper Mill Pours

6-Story Building and 9 Bleaching Towers Go Up in 10 Days With Sliding-Form Method of Concrete Construction



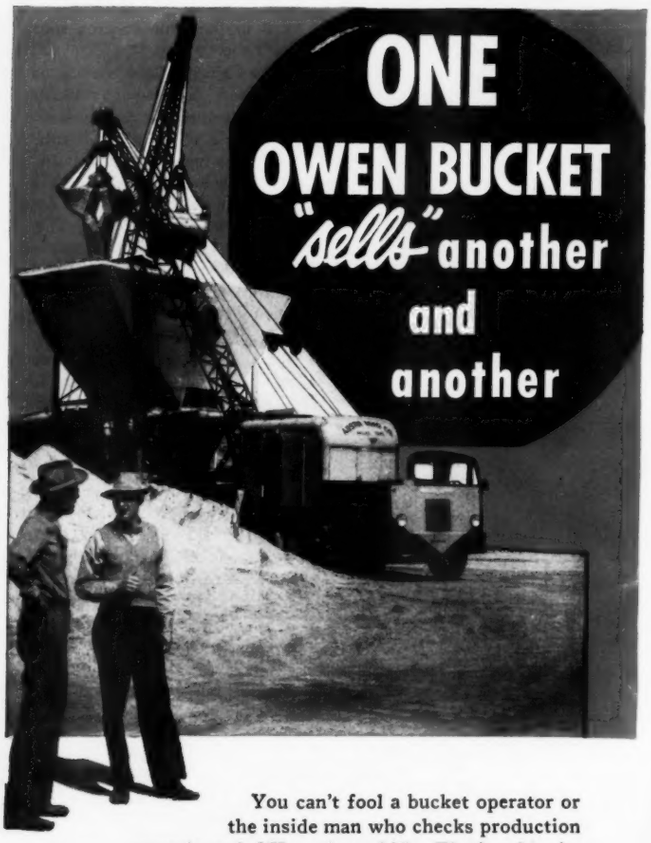
Hollingsworth & Whitney Co.'s bleach plant in Mobile, Ala., went up in 10 days. The Rust Engineering Co. used the sliding-form method.

• A PROCESS by which a building is hauled up by its own screwjacks in a continuous lift operation was recently used by The Rust Engineering Co., Pittsburgh, Pa., designer-constructor. Rust engineers estimate the sliding-form method is nearly ten times faster than similar construction with fixed or so-called movable forms.

In this method of construction, 1-inch rods of special alloy steel are set vertically among the reinforcing rods in the concrete at intervals. A screwjack mounted on a yoke climbs each special jack rod by means of dogs. As the screwjack is turned it pulls up the yoke, which in turn hauls up an attached wooden form and working platform. The rate of climb depends on the rate the concrete sets, which is influenced by weather conditions—slower on a cool wet day, and faster on a hot dry day. The 20-foot jack rods are continuously extended by a pipe-sleeve arrangement as the walls go up. Height of the rods is carefully staggered for strength and continuous operation.

Bleach Plant Poured

The new pouring method has been successfully applied in the construction of a bleach plant—where the building as well as the bleaching



You can't fool a bucket operator or the inside man who checks production records and OKs upkeep bills. That's why the first Owen Bucket generally leads to the purchase of additional Owen Buckets.

High production is literally visible to the eye at each grab and low maintenance costs are apparent by the absence or infrequent appearance of repair bills.

Based on repeat order records we say—"Buy your first Owen Bucket and it is more than likely that Owens will become your 'standard' thereafter."

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Sauerman Scraper cutting down a bank.

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SAUERMAN SCRAPER

Dig an underpass, trench a stream, clean a culvert or tunnel, build dykes or cut down banks . . . *One man*—using a Sauerman Scraper—can do them easily and economically.

The curved plates of the Crescent Scraper and bottomless construction combine maximum strength with minimum weight, thus reducing power costs.

See for yourself why Sauerman Machines can give you maximum efficiency on many dig and haul jobs. Write for illustrated 24-page Catalog A. Sauerman Bros., Inc., 564 S. Clinton St., Chicago 7, Ill.

SAUERMAN BROS., INC.
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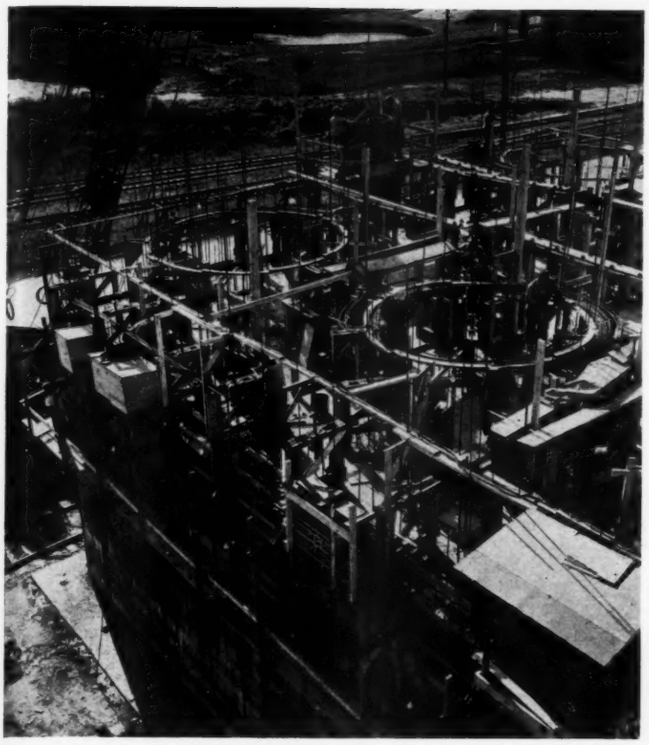


Here's the plant about one-third of the way up. The entire structure, including columns and nine bleaching towers, went up at the same time.

towers were erected by the sliding-form method—at the Hollingsworth & Whitney Co. paper mill in Mobile, Ala. The 6-story building with walls 77¼ feet high was poured in 10 days, including columns and nine bleaching towers which went up with the walls. The towers themselves averaged 14 feet in diameter and 60 feet in height.

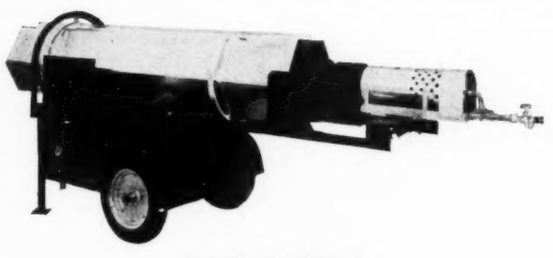
Two 30-foot-diameter x 46½-foot-high concrete storage tanks for bleached stock were also constructed by the sliding-form method. The new unit is expected to increase the mill's existing capacity for bleach stock by 150 tons per day.

The operating floor has an exterior brick wall with glass block windows and contains the bleach plant controls and a laboratory. Consistency of the paper stock and temperature of the wash water are automatically controlled from this floor. Manual controls located here can regulate flow of the stock and adjust flow of the different chemical solutions used in the bleaching process.

In the process used—the Kamyr continuous bleaching system—the brown stock entering the building goes through the bleaching towers where it is subjected to chlorine, caustic, and other chemicals to take out the color.

Bleached stock is used in making high grade paper as against the unbleached kraft paper which retains the brown color and is used for wrapping paper, paper bags, etc.

SAND BLASTERS



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Do you need **dry sand? dry stone?** Get it Right-on-the-job Fast and Economically. Hourly capacity for **SAND—6 to 10 tons;** for **STONE—10 to 15 tons.**

FEATURES: 1. **RUGGED** all welded design. 2. **ENGINE or ELECTRIC** MOTOR drive. 3. **Automatic Kerosene Pump.** 4. **MOBILE**—tow or carry by pick-up truck. 5. **SIMPLE** to operate. 6. **EASY** to service.

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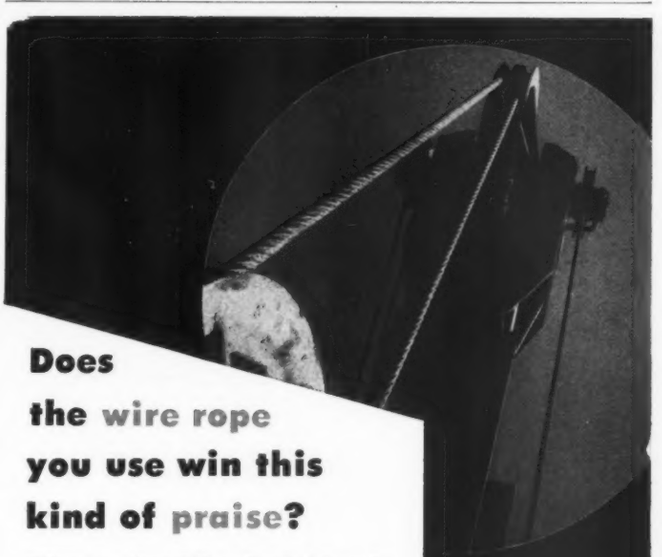
PINEWOOD AVE. SARATOGA SPRINGS, N. Y.

New Cartwright Distributor Bars Give Balanced Pressure With No Drip

SD Model at right has been designed particularly for city use and to meet a limited budget without sacrificing performance.

Shown at left is a 1250-gallon Precision Distributor. Write for bulletin describing this most advanced equipment and the new Cartwright Circulating No Drip balanced pressure spray bars.

GENERAL STEEL TANK COMPANY
P. O. Box 552 **Birmingham 1, Alabama**



Does the wire rope you use win this kind of praise?

"I have preferred Hercules Red-Strand wire rope since 1909," says an operations superintendent. "I just wouldn't use any other." Another operator reports a truly remarkable record: "Red-Strand outlasted any other rope by three times!"

HERCULES Red-Strand *earns it*

Why do these men, among others, praise Red-Strand so highly? In a few words, it's because *higher-than-rated quality* in Red-Strand wire rope means *longer-than-expected* service. . . year in, year out.

Next time, use Hercules Red-Strand. You'll experience the difference too.

HERCULES® Red-Strand wire rope made by A. Leschen & Sons Rope Company, St. Louis 12, Missouri

In business only to make wire rope . . . better wire rope . . . since 1857

HIGHER-THAN-RATED QUALITY

LESCHEN
WIRE ROPE AND SLINGS

A. LESCHEN & SONS ROPE COMPANY

DISTRIBUTORS IN ALL PRINCIPAL CITIES

Vollmar Bros. Construction Co., of St. Louis, at the St. Agnes Home for the Aged, St. Louis County, Mo., revives an ancient art—laying stone by hand. The $500,000 expansion program consists of adding a new convalescent wing and chapel to the home.

Scribing Method in Mapping Discussed

A new process of making maps by scribing or engraving them on plastic or glass was discussed at the 13th Annual Meeting of the American Congress on Surveying and Mapping which was held on March 23, 24, and 25, at the Shoreham Hotel, Washington, D. C. Advocators of developing this method pointed out a saving of an estimated 30 to 70 per cent to taxpayers. A comparable amount of working time could be saved because map manuscripts are scribed on dry surfaces and there is no ink to dry or smear, as in pen and ink drafting. Corrections can be made any number of times by merely recoating the working surface and rescribing lines and symbols in their proper positions.

Representatives of Federal-government mapping agencies were panel members at a session discussing "Plastic or Glass Engraving Versus Drafting". They related further advantages of scribing, such as the speed in training scribers as compared with teaching people to draft —an estimated 3 days to 4 weeks as against 2 weeks to 4 months to train draftsmen. One speaker reported that his agency found it could train almost 100 per cent of scriber applicants as against about 60 per cent of drafting trainees. Other speakers pointed out the elimination of several photographic processes which the scribing method allows.

Instruments which have been developed for engraving were on exhibit in the panel-discussion room. Also on view were instruments, machines, and supplies used by surveyors and map makers. It was the most extensive and varied exhibit ever staged by the ACSM, affording an unusual opportunity to students to see equipment not ordinarily found in engineering schools, as well as keeping delegates up to date on the latest equipment and procedures.

While ACSM membership is composed of representatives of state and Federal governments, private enterprise, engineering firms, engineers, and others interested in the field, engineering students were invited to attend free of charge. Latin American and Canadian groups were also represented at the meetings.

The address of welcome, opening the meeting on March 23, was given by the Honorable Sinclair Weeks, Secretary of the U. S. Department of Commerce. At the technical session on March 24, two papers "The Surveyor's Handbook" and "Surveying Problems in Texas" by two engineers who are land surveyors as well were considered. Further discussions included topics such as: "International Cooperation in Mapping", "How Much Topographic Detail", "Topographic Maps Along Our Highways", and "Cartography Courses—Engineering or Geography Curriculum?"

Sessions were highlighted by the presence of prominent guest speakers and followed by a number of social activities.

Steel Reinforcing Bars

Dumbbell-shaped steel reinforcing bars with longitudinal and transverse ribs are shown in a folder from the Copperweld Steel Co., Warren, Ohio. The bars are cold-twisted to the proper pitch for maximum yield strength.

The manufacturer points out that the Webrib bars also have a greater bearing area, which increases bond resistance.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 40.

K-89 SUPER HEAVYWEIGHT This 90 lb. bruiser will knock the starch out of those tough, heavily reinforced concrete sections.
K-81 HEAVYWEIGHT Strikes faster, heavier blows than comparable breakers. Is easier to hold and operate. Raps right through the toughest jobs.
K-61 MEDIUM WEIGHT A hard-hitting but very easy-handling Breaker designed for thin-section concrete and other average demolition jobs.
THE THRIFTY JOY DUAL-VALVE
MAKES AIR DO MORE WORK!
Permits higher drilling speeds with lower air consumption. Effectively lowers drilling costs.
JOY PAVING BREAKERS
. . . WHEN DEMOLITION IS YOUR AIM!
Joy Paving Breakers are cadmium-plated inside and out—and you know what that means. The cadmium stops rust and corrosion, prevents scoring, and speeds up the running-in of the new tool. Lubrication is controlled by the throttle. Each movement actuates a mechanism which shoots the proper amount of oil to all working parts.
You've a dual-purpose tool with a Joy Breaker, too. Swap the chuck housing for a driving shoe and guide, and . . . PRESTO . . . you're holding the world's finest Sheeting Driver!
Joy Breakers offer less jarring and operator fatigue . . . less maintenance and replacement. Interchangeability of parts allows a smaller parts inventory. ● Descriptive bulletins tell all. Write Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.
Consult a Joy Engineer
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CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY
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Write Dep't. 1 for Right of Way Booklet

THOMPSON CHEMICALS CORPORATION
St. Louis 3, Mo. Los Angeles 27, Calif.

High Tides Hamper Bridge Pier Building

U. S. 1 Gets a New 2-Span Composite-Steel Beam-and-Girder Bridge With a Reinforced-Concrete Deck

Closeup of the incoming tide rushing between the center pier and the crane barge on the W. H. Hinman & Co. contract. *C. & E. Photo*

• BUILDING a bridge pier in the middle of a narrow tidal inlet provided some tough working conditions last year for a New England contractor. W. H. Hinman & Co. of North Anson, Maine, had the contract to construct a new bridge for U. S. 1 near the coast of Maine between the towns of Damariscotta and Newcastle.

This estuary area only 10 miles from the sea suffers from tides as high as 13 feet. The condition at the inlet is particularly tricky because it is flanked by two large bodies of water—Damariscotta Lake on the upstream side, and a wide estuary on the downstream side.

Every incoming tide forces a near torrent to squeeze through the inlet; 6 hours later the process reverses. With water racing past the construction site in two directions and at speeds up to 6 to 8 miles per hour, special precautions were required to keep both materials and equipment in place.

New Bridge

The $377,000 contract, awarded last spring by the Maine State Highway Commission, called for the construction of a 2-span composite-type steel beam-and-girder bridge with a reinforced-concrete deck. Almost ½ mile of highway approach work was also included.

The old steel truss bridge with an 18-foot roadway had been inadequate for the increasing traffic on U. S. 1. The structure was built almost 50 years ago, and some authorities estimate the original cost at only $9,000.

Designed for H20-S44 loading, the new bridge has a 28-foot roadway on a 1.88 per cent grade. Two 5-foot sidewalks are also provided. The two half-spans form a total out-to-out length of 165 feet. Foundation work consisted of extending the old abutments and building a stone-faced pier in the middle of the inlet. The pier footing is 62 feet long, 12 feet wide, and 11 feet deep. The stem is 20 feet high.

Temporary Trestle

The contractor moved in during May, 1952. The second floor of an adjacent building was rented to provide an office and it made an excellent observation point.

The first job was to build a temporary wooden trestle to relocate the heavy traffic. During the peak summer months, vehicle counts as high as 25 per minute were recorded on that section of U. S. 1.

Bents composed of seven 12-inch-diameter spruce piles were driven with a drop hammer suspended from a Northwest crane. The 5 inside piles were driven plumb and the 2 outer ones were battered. Each bent was triple-braced with 3 x 10's. The complete trestle used 28 bents on 10-foot centers.

The 22-foot-wide trestle roadway was covered with interlocking steel decking, not salvaged from the old bridge but Navy surplus flight-deck steel planking. The surface was tarred and a 5-foot walkway added for pedestrians.

With traffic rolling on the temporary trestle, the contractor went

(Continued on next page)

TAKE IT EASY—BUT DO MORE WORK

The SKID SHOVEL is the only loader equipped with the Drott Hydro-Spring, a super shock-absorber that saves wear and tear on equipment and operator. On International TD-6, TD-9, TD-14A, TD-18A Tractors.

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DO YOU LIKE YOUR EQUIPMENT TOUGH?

Galion Model 700 hydraulic hoist with Model 12 contractors' heavy duty body.

▶ If you need dump truck equipment that is built to take a beating day after day without downtime . . . that will work longer with less maintenance and operating cost . . . that you can be proud to own and operate . . . you should become a Galion user—right away!

▶ There's a standard Galion model to meet virtually every need of every contractor. But, if you need extra heavy duty units for jobs that are tougher than tough, Galion will be glad to design and build them to your specifications. A-6720

Just see your nearest Galion distributor—today!

THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

High Tides Hamper Bridge Pier Building

(Continued from preceding page)

to work dismantling the old truss bridge. Airco torches cut up the steel in sections that could be crane-loaded and hauled away.

Sheet Piling

The old abutments required considerable rebuilding and extending. The surrounding area was first excavated with an orange-peel bucket. Then 36-pound sheet piling, rented from L. B. Foster Co., was driven around the entire abutment. A McKiernan-Terry 7-B hammer supplied with air from two Chicago Pneumatic 315-cfm compressors did the driving.

On the west abutment, the contractor ran into difficulty sealing out the sea. He had to drive an extra set of piling parallel to the first and 3 feet away. Between these he dumped 4 feet of concrete and covered that with 8 feet of fill. On both abutments, 12-inch-diameter piles with timber wales guided the sheet piling.

Barge-Mounted Crane

All excavating, driving, and material-handling for the center pier was done with a pontoon-barge-mounted Link-Belt Speeder crane with a 65-foot boom. The 28 x 72-foot barge was made up of 48 pontoons, each 7 x 5 feet and 5 feet deep.

Because the water rushed past the site in both directions, it was necessary to tie down the barge on both ends. The downstream side was held by a 6,500-pound Navy anchor plus a 1-inch wire-rope line to a large tree on shore.

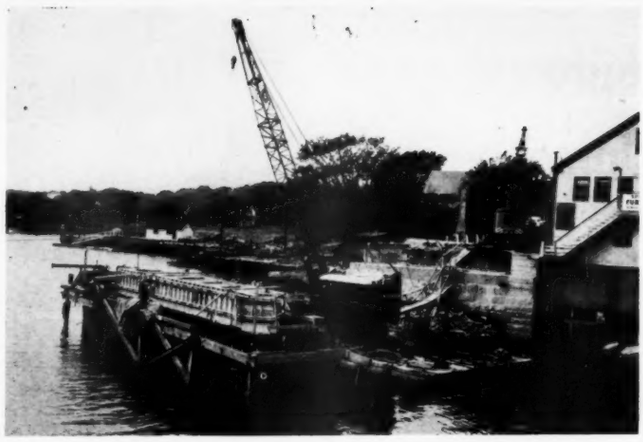
For the upstream side, the contractor drove two 14-inch H-piles to refusal and tied the barge to these. One line was connected to a barge-mounted 2-drum winch powered by a Waukesha engine. The H-piles were also tied to large trees on the upstream shores. These special upstream supports were necessary because of the unusually large force of the water against the barge at the peak of the outgoing tide. The heavy barge often dipped its bow into the water with a 5-foot list.

Excavation

All excavation for the pier footing was done by the barge-mounted crane using a 1-yard Blaw-Knox bucket. Difficulties arose here because of the size of some of the boulders. On one occasion, the bucket grabbed a boulder that was estimated to be at least 8 cubic yards. It was too heavy to lift out of the water, but the crane could at least hold on to it with the help of the boulder's own buoyant force. The contractor decided to allow the barge to drift slowly downstream until it reached a point away from the channel where the crane bucket could just let go. This was done successively, and the barge was pulled back to its pier position by its own winch.

All other footing excavation was used to build up the slopes at the abutments.

After the hole had been prepared, the crane was fitted with the 7-B hammer to begin driving sheet piling. H-piles were driven as guides and then cross-braced with steel members to stiffen them against the current. Timbers were used as wales.



A barge-mounted Link-Belt Speeder crane did the excavating, driving, and material-handling on the U. S. 1 bridge project in Maine. *C. & E. Photo*

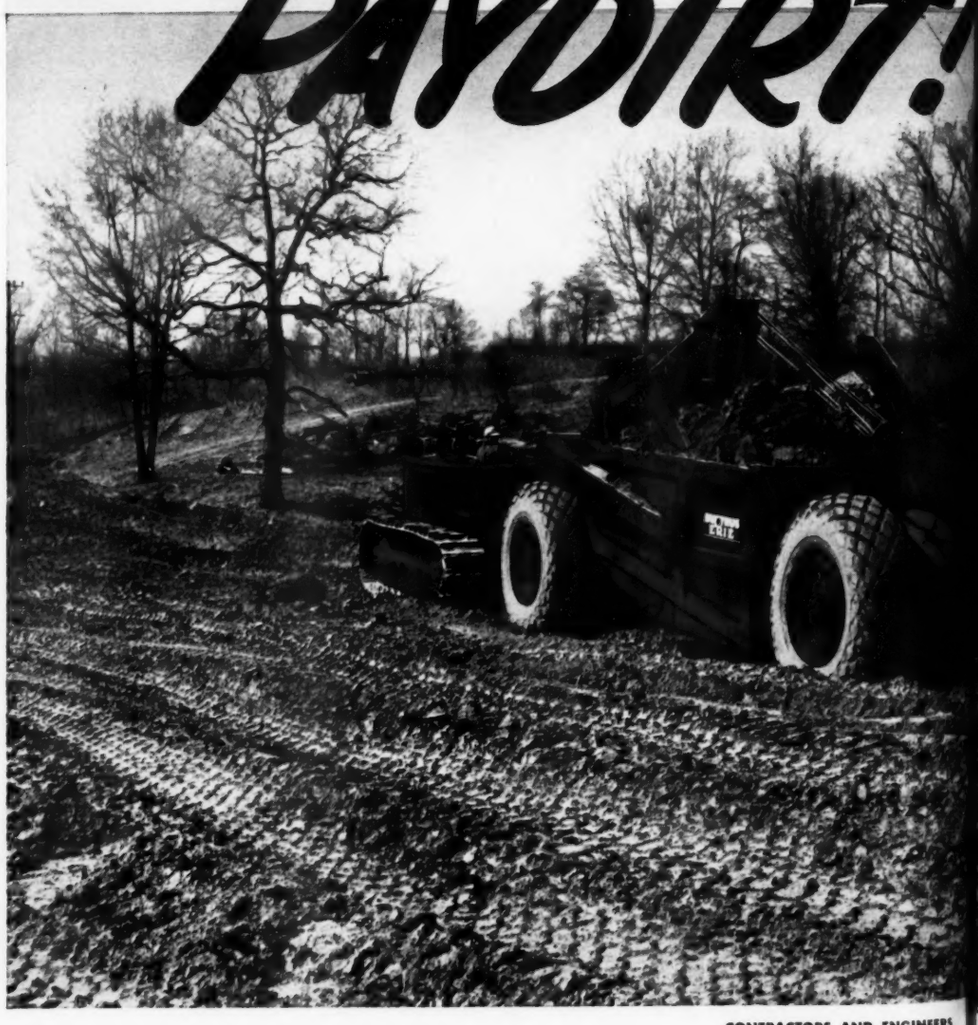
Concrete

Concrete for footings was placed with a 1-yard underwater bucket in 3-foot lifts. After the concrete had set, the coffer was dewatered below the top of the footing, the laitance cleaned off, and forms set for pouring the pier stem. The spex called for keeping salt water away from concrete for at least 72 hours. This dewatering was done with one 6-inch and two 4-inch Le Roi pumps. Sheet-piling joints were sealed with cinders at each mean tide.

Concrete was batched and mixed at a pit about a mile from the job. Stone aggregate was hauled in from a quarry about 55 miles away. A Northwest Moto-Crane charged the 3-compartment batch bin. For pours smaller than 75 yards a Farmall tractor with a ¼-yard bucket was used at the bin. Mixing was done by two Koehring 3-bag mixers. Cement was supplied in bags and

BIG RED TEAM *

PAYS OFF WITH MORE PAYDIRT!



handled by hand. Four 2-yard Dumpcretes mounted on Chevrolet trucks hauled the concrete to the job.

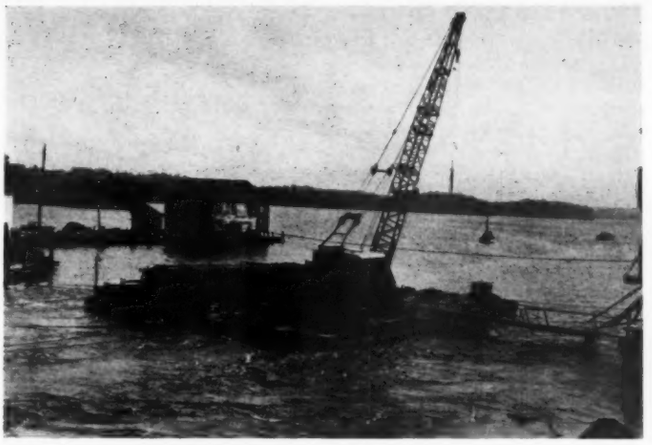
Standard wood forms with Williams ties were used on the pier stem. They were left on 7 days while the concrete was water-cured.

The biggest pour was 330 yards in 15 consecutive hours. Concrete was air-entrained with Darex agent.

Granite stone was placed on the pier and on abutment faces. Lead wool was rammed into the joints with Bicknell hammers to seal out seawater.

Approaches

Because of the heavy summer traffic using U. S. 1, the $130,000 of approach work was not started until the fall. The work consisted of building almost ½ mile of variable-width road with a 6 to 9-inch crown. The pavement consisted of 2 inches of bituminous concrete surface on 6 inches of bituminous concrete base over 24 inches of compacted gravel.



Tide water races past the construction site at 6 to 8 miles per hour. *C. & E. Photo*

Drainage was first put in with a Bucyrus-Erie backhoe. The 13,000 yards of waste was excavated by a 1-yard Lorain shovel. Base-course gravel was loaded by a ¾-yard Link-Belt shovel. All hauling was done with a fleet of ten hired Chevrolet trucks.

An International TD-9 and a TD-18 did rough grading and an Adams grader was used for final shaping. Bituminous concrete was hauled from Hinman's plant in Lisbon and spread with a Barber-Greene paver.

Personnel

N. D. Moon, Superintendent for W. H. Hinman, employed 35 men on the bridge work. Nick Depatsy, Superintendent, used 45 men on the road. The job started in May and was completed by December.

George Stangle was Resident Engineer for the Maine State Highway Commission on the bridge portion and Kenneth Whitney on the approaches. The Commission is headed by Lucius D. Barrows.

Lubricants Announced

A lubricant without a soap base which, according to the manufacturer, will not break down, melt, or freeze, is made by the Warren Refining & Chemical Co., 750 Prospect Ave., Cleveland, Ohio. Plastilube is adhesive in boiling water and retains its pumpability at low temperatures.

Although the main use of the product is for lubrication of bearings where temperatures vary from below freezing to more than 500 F, it is said to be adaptable for other automotive and industrial uses.

The company has also developed a new lubricant for open gears. Warco is said to have greater adhesive properties and a higher melting point than other lubes that require melting or cutting with solvents before application. It can be applied cold by hand or paddle, will not peel off when operating at high temperatures, and can be used outdoors under any climatic conditions.

For further information write to the company, or use the Request Card at page 18. Circle No. 105.

Sewer-Joint Compound

A 4-page folder on a new cold plastic sewer-joint cement is offered by the Philip Carey Mfg. Co., 316 S. Wayne Ave., Cincinnati 15, Ohio. Sewertite and its uses are described in a 4-step pictorial sequence that explains how to apply the compound. A table gives quantities required for bell-and-spigot joints and tongue-and-groove pipes.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 139.

"I was desperate. My nervousness was costing me one job after another. Then finally. . . ."

BIGGER LOADS EVERY TRIP . . .

You get heaped loads faster with a Bucyrus-Erie scraper's boiling-action loading. This has been proved time and time again in actual field tests. The loading action breaks up big chunks to give you a compact and uniform fill, and extra pounds of dirt in every cubic yard.

MORE TRIPS PER DAY . . .

Big tires, low center of gravity and increased all around stability give you the flotation and maneuvering ability for extra trips every working day. The streamlined gooseneck permits short turns. Dumping is quick and clean with positive rolling ejection. It all adds up to faster hauling cycles . . . and more dirt moved per day.

11T53C

* Bucyrus-Erie scraper and TD-24 tractor

BUCYRUS ERIE

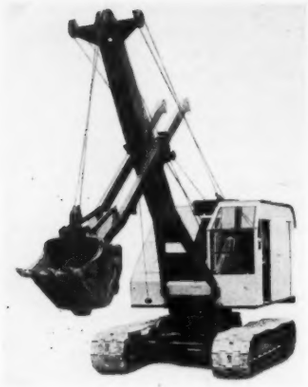
BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

See your International Industrial Tractor Distributor soon for all the facts about the Big Red Team . . . it will pay you to use the equipment that delivers the most paydirt for your money.

THREE B-TYPE SCRAPERS TO CHOOSE FROM

Model	Capacity	
	Struck	Heaped
B-250	22 cu. yd.	27½ cu. yd.
B-170A	16 cu. yd.	21 cu. yd.
B-113	10 cu. yd.	14 cu. yd.

SEE YOUR INTERNATIONAL INDUSTRIAL TRACTOR DISTRIBUTOR



Twin Dipper Stick For ½-Yard Shovel

A new ½-yard shovel made by Little Giant Crane & Shovel, Inc., E. 16th & Howard Drive, Des Moines 13, Iowa, features a twin dipper stick. The Model S can be converted to a crane, pile driver, dragline, or trench hoe. It is available tractor or truck-mounted, and also for mounting on the customer's truck. Dumping radius is 21 feet and dumping height is 15 feet 3 inches. Digging depth below ground level is 3 feet 6 inches.

Other features include a ball-bearing turntable that eliminates rollers and center pin. Sealed cartridge-type bearings are used on all main shafts. The manufacturer stresses that the cable crowd drum is accessible for maintenance.

For further information write to the company, or use the Request Card at page 18. Circle No. 6.

Booklet on New Ditcher

A folder describing its Model 705-B Runabout Ditcher has just been released by Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill. The 705-B is a wheel-mounted unit specially designed for use by utilities, governmental bodies and contractors.

The three principal features of the machine—a Chrysler fluid coupling, the hydraulic Hydra-Crowd digging transmission, and the curved-tooth bucket line—are discussed. The fluid coupling protects the drive mechanism from sudden shock from overloads or hidden obstructions.

Other features include a 15-mph road speed, a high road clearance, and a counterbalance valve which prevents creeping when digging on a slope.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 140.

Marietta Plant in Florida

Marietta Concrete Corp. of Florida has recently been incorporated as a subsidiary of Marietta Concrete Corp., Marietta, Ohio. The new plant, designed by Overend & Boucher, Wichita, Kans., will be located at Hollywood, Fla. When the building is completed, approximately 200 workers, including key men from the Ohio plant, will be employed to produce mortarless concrete blocks, precast-concrete wall panels, and silos.

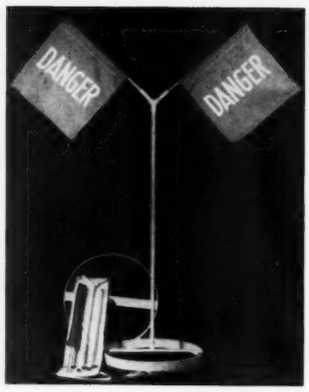
F. L. Christy, President of Marietta Concrete Corp., Ohio, will head the Florida firm.

Double Flag Standard

A new portable flag standard is manufactured by the Charleston Rubber Co., Stark Industrial Park, Charleston, S. C.

The new McGard flag standard is a Y-type holder that keeps two red danger flags at the eye level of approaching drivers. The upright is made of steel pipe fittings. The manufacturer states that if the standard is hit, the upright shears off at the base avoiding damage to the car, and can be rethreaded or replaced.

The unit is painted yellow for high visibility. It packs into a small canvas bag and is assembled or taken apart without tools.



For further information write to the company, or use the Request Card at page 18. Circle No. 7.

Folder on Tarpaulins

Tarpaulins for trucks, buildings, and machinery are described in a folder from Webb Mfg. Co., 4th and Cambria St., Philadelphia 33, Pa. The waterproofed coverings come in light, medium, and heavy weight. Sizes are 8 x 10 feet to 20 x 30 feet; special sizes can be ordered.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 141.

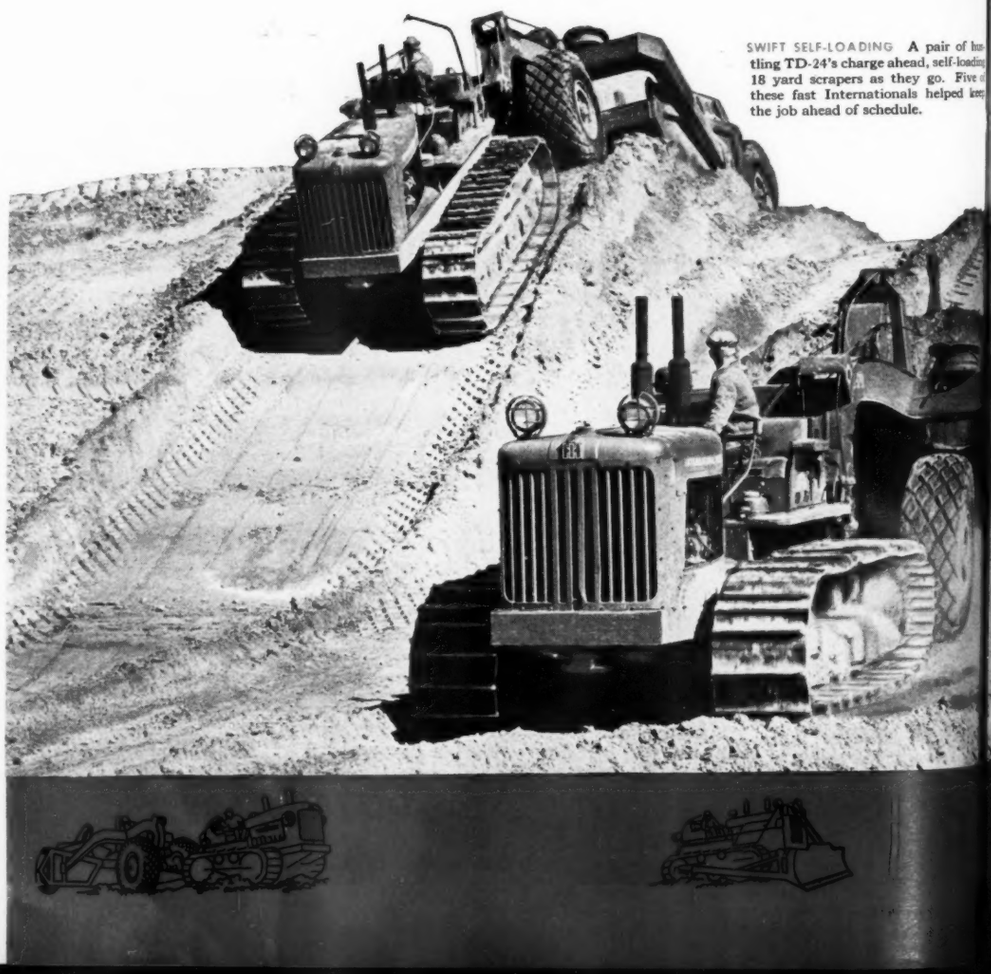
"Big Red"

Contractor completes job 45 days ahead of estimate as TD-24 fleet moves a million yards

Ryan Construction Company, Evansville, Indiana, took on a big job when they contracted to move a million cubic yards of dirt and place 35,000 tons of riprap in site preparation for a new steam generator plant on the Ohio River.

From the first day on the contract, Ryan's five TD-24's made the dirt fly. Their assignment: to cut down two hills and dump the excavated material in old creek bed to make a new power plant site.

They averaged 4 minutes and 40 seconds on the 2,000 foot round trip between cut and fill. Self-loading heaped



SWIFT SELF-LOADING A pair of hustling TD-24's charge ahead, self-loading 18 yard scrapers as they go. Five of these fast Internationals helped keep the job ahead of schedule.

New Portable Dryer

A new portable asphalt dryer for use with the H & B Moto-Patcher is announced by Hetherington & Berner Inc., 700 Kentucky Ave., Indianapolis 7, Ind. It has a drying capacity of up to 10 tons per hour.

Aggregate feeding is by rotary elevator from truck, or by hand feed. The drum is 8 feet long and 30 inches in diameter. The fuel-oil tank has a capacity of 40 gallons.

The power unit is a Briggs & Stratton Model 23R6 with reduction gear and Viking fuel pump. The dryer attaches to any standard-make truck with towing hitch.

The new portable dryer for use with the H & B Moto-Patcher.

The H & B Moto-Patcher is a mobile mixing unit used for maintenance work on roads and streets and small construction jobs. It delivers up to 10 tons per hour of freshly mixed material.

For further information write to Hetherington & Berner Inc., or use the Request Card that is bound in at page 18. Circle No. 4.

SOS—Engineers Needed

Civil-engineer graduates are going to be in short supply until at least 1955, according to the Engineers' Joint Council. EJC's Manpower Committee has kept a steady check on the engineering schools since shortly after World War II, and its figures indicate a steadily decreasing number of enrollments in freshman classes. As regards the immediate situation, indications are that there will be a total of only 17,200 graduates available for private employment when June graduations are over. And the estimated demand is for about 30,000 young civil engineers. The figure of those expected to be available takes into account that about 6,100 of the graduating engineers will go directly into the armed services.

Various reasons are being put forward for this falling off of enrollments. One is that in 1950 the Bureau of Labor Statistics circularized high schools with misleading information to the effect that civil engineers would find it hard to get jobs in the future. Three other factors cited are the steadily increasing drain to the armed forces; the failure of many civil-engineering graduates to enter the field (on account of their training making them excellent potential executive material); and, at least until recently, lower starting-pay scales.

In 1952, however, civil-engineering graduates were rated at between $325 and $350 per month—considerably higher than they have ever been listed. This means that state and municipal agencies are finding it increasingly difficult to fill their needs, and some state highway programs, for instance, are bogging down for lack of engineering personnel.

EJC thinks that young men should reconsider the position. Not only does the nation need engineers, and need them badly, but the engineering profession is a rewarding one. And this applies not only to the mental satisfaction to be obtained from it. From the hard-cash-and-no-nonsense point of view, too, says EJC, let these young men remember that one result of the shortage has been a steady increase in starting-pay scales in private employment.

Data on Line of Equipment

A new brochure presents the line of construction equipment manufactured by Mixermobile Manufacturers, 8027 N. E. Killingsworth, Portland 20, Oreg. The diversified line includes the Scoopmobile, a hydraulic front-end loader; the Duo-Way scoop, which is scoop and dozer; the Duo-Way lift with folding track; the Dozermobile that has 4-wheel power steering; and the utility tractor, Tractormobile. The booklet has photos of these units and a number of others. One section describes available attachments.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 142.

TD 24

Rolls for Ryan

scrapers, the Big Red fleet moved tremendous yardages every day—kept doing it even in rain and mud, the Ryan people report.

TD-24's are the fastest and most powerful crawlers on the market. That's why "Big Red" performance is paying off not only for Ryan but for contractors across the country who need big crawler power to get tough jobs done on time.

And you can't beat the service provided by your nearby International Industrial Distributor. His trained servicemen, complete stocks of parts and up-to-date shop facilities are available to you anywhere, anytime to keep your equipment in production.

He and the famous line of IH crawlers he sells are willing and able to help you put your contract on a paying basis.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

POWER STEERING WITH FULL LOADS mean faster cycles, higher daily production. Because "Big Red" steers with full power on both tracks, it can maneuver with the same heavy loads that can be pulled on the straightaway.

WATCHING BIG RED ROLL Ryan Construction men keep close tabs on the performance of their five TD-24's. Cycles are clocked for half an hour every morning and afternoon. Left to right: Guy Tilley, Job Superintendent, Tom Vickers, Job Foreman, and Virgil Scales, Superintendent.

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

Power-Steering Unit

A power-steering attachment for tractors is announced by the Behlen Mfg. Co., Columbus, Nebr. Present models are suitable for tractors with center steering shafts.

The manufacturer points out that the unit increases efficiency by decreasing the effort required of the operator.

The unit also insures greater safety. Lost-time accidents result from upsets when the front wheels of self-propelled equipment hit rocks, planks, and rough terrain, causing a backlash that whips the steering wheel out of the operator's hands. The Behlen power-steering attachment is said to absorb those shocks in the hydraulic unit.

For installation, about 2 feet of the conventional center steering shaft are removed. A new piece of shaft with the power unit attached is inserted.

The new Behlen power-steering attachment for tractors is said to increase efficiency and safety on the job.

A small hydraulic pump is placed between the timing gear case and the magneto or distributor assembly. The power unit, attached to the new section of shaft beneath the steering wheel, consists of a fluid pump driven off the tractor engine with a hydraulic gear motor, converting the fluid pressure into mechanical torque.

For further information write to the company, or use the Request Card at page 18. Circle No. 108.

Material-Testing List

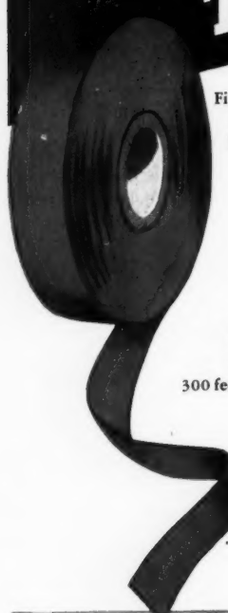
A suggested list of apparatus for laboratory tests of concrete and bituminous materials has been completed by the Central Scientific Co., 1700 Irving Park Road., Chicago 13, Ill. The listing specifies equipment by type and size. It also gives the numbers of available catalogs and prices.

Among subjects covered are aggregate tests, soil tests, bituminous-penetration and viscosity tests, and a test for the determination of the percentage of bitumen in bituminous mixtures.

To obtain Bulletin No. 2001, write to the company, or use the Request Card at page 18. Circle No. 144.

STANDS UP IN
ALL KINDS OF WEATHER

VISKON®
NONWOVEN
Flagging Tape



Fieldmen prefer VISKON flagging tape for its outstanding qualities. Rugged, bright, nonwoven fabric won't fade in any weather conditions. Comes in brilliant red, orange, blue, yellow, white. Use VISKON wet or dry—won't rope . . . won't become brittle in cold weather . . . easy to tie. Supplied on handy core to loop right on your belt. Non-toxic. Easy to write on. Standard put-up 1½ inches wide, 300 feet to a roll . . . other sizes available.

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NONWOVEN FABRIC
. . . another product for modern industry by
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Please send information on VISKON plus free sample swatch of each survey flagging tape color.
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Best electric
HAMMER AND SPADE
on the market

AMERICA'S No. 1 BUY

Write for
CATALOG No. 981

Trouble-free Master POWER BLOW Electric Hammer drills ¼" to 2" diameter holes and can be equipped with spade and full line of hammer tools. Requires only 450 watts to operate, 115 volt AC, 25, 40, 50 or 60 cycles or DC or from any generator plant. 230 volt hammers available. See your dealer today!

MASTER VIBRATOR COMPANY • DAYTON 1, OHIO

Master Portable Generator Plants ½ KW to 100 KW
Master Vibratory Concrete Finishing Screed
Master Power-Blow Electric Hammer and Spade
Master Space Heaters
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MASTER
BETTER PRODUCTS FOR BIGGER PROFITS

Bituminous Concrete For Runway Extension

Corps of Engineers' Expansion Job at Bradley Field Includes Building of New Taxiway and Runway Section

An Adnun paver spreads stone and four Buffalo-Springfields roll it. *C. & E. Photo*

By ALBERT C. SMITH
Associate Editor

• THE pace-setting growth of the aircraft industry, both civilian and military, is making bigger and bigber demands on airport facilities throughout the country. Runways must be made both longer and stronger, terminal structures expanded, and safety regulations modernized.

One airport that is keeping in tune with the times is Bradley Field at Windsor Locks, Conn. Last fall it opened an ultra-modern terminal building (see C. & E., Aug., 1952, pg. 12) and extended its main runway nearly 2,000 feet.

The airport's history began just before the last war when the State of Connecticut acquired the 1,200-acre site. The Army took over shortly after and used it as a fighter base. Today, the field has been restored to commercial use and is operated again by the State. The runway and taxiway-extension project, however, was financed by the National Guard Bureau and designed by the U. S. Army Corps of Engineers.

Located less than 15 miles from the population centers of both Hartford and Springfield, Bradley Field is one of the top commercial airports in New England. The north-south runway is about 5,200 feet long; the northwest-southeast runway about 5,500 feet long; and the northeast-southwest runway is being extended to 6,700 feet.

The $480,000 runway extension job was awarded to the Zielinski Bros. of Agawam, Mass., in July, 1952, by the New England Division of the Corps of Engineers, U. S. Army.

Job Layout

The work consisted of constructing a 1,700-foot runway extension, a 3,000-foot taxiway, a 1,000-foot runway overrun area, and extensive lateral safety zones. The runway is 220 feet wide and the taxiway is 75 feet wide. They are parallel and separated by a 400-foot-wide shoulder. A 200-foot shoulder flanks the outside edge of the runway and a 50-foot shoulder flanks the outside edge of the taxiway.

The end of the runway merges into a 250-foot-long blast strip which forms a part of the 1,000-foot-long and 600-foot-wide overrun area. Wooded sections beyond the overrun area were cleared to provide a glide angle of 50 to 1. On the sides of the runway, a glide angle of 7 to 1 was used to determine what areas should be cleared to conform to Air Force lateral clearance safety requirements.

Surface

The pavement of both runway and taxiway consists of two 1½-inch courses of bituminous concrete on two 3-inch courses of dry-bound macadam. Including a ½-inch layer of screenings at the base, this provides a 9½-inch-thick pavement.

The dry-bound macadam was prime-coated before receiving the first course of bituminous concrete. A tack coat was used between the two 1½-inch top courses. The top 10½ inches of subgrade was compacted to 100 per cent of the maximum density at optimum moisture as determined by the modified

(Concluded on next page)

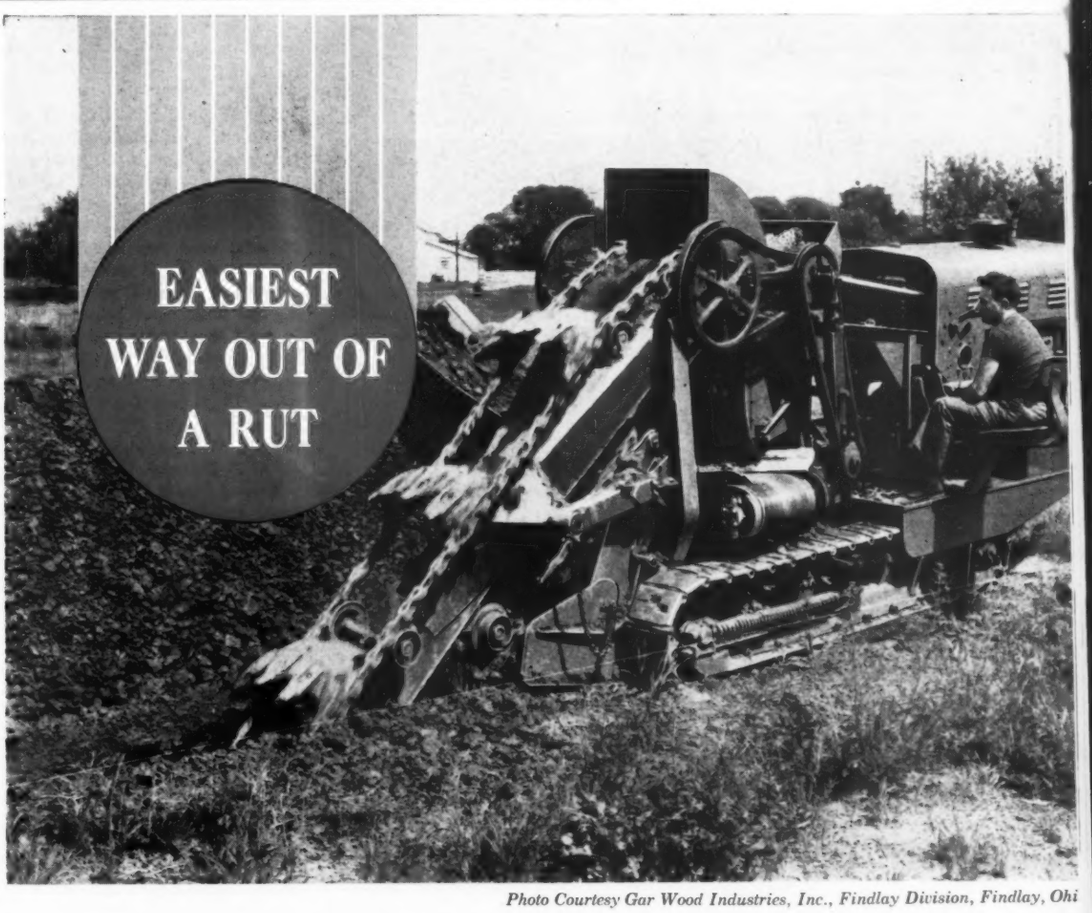
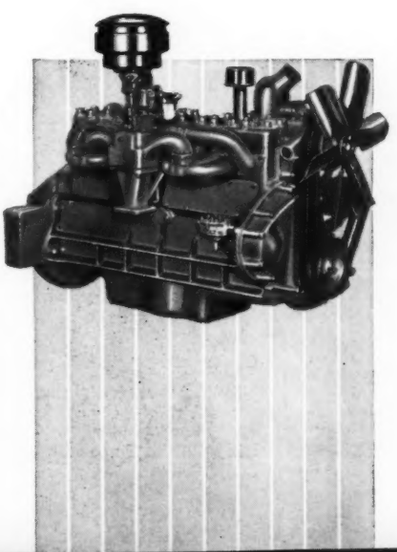


Photo Courtesy Gar Wood Industries, Inc., Findlay Division, Findlay, Ohi

Pedigreed Horsepower digs ditch, carries dirt away, moves ditcher!



Without ever moving from his seat, this operator can dig a ditch eight feet deep and up to twenty-four inches wide. With an individually controlled clutch and brake for each crawler, he can dig straight as an arrow or curved as nicely as you please. With positive-pressure hydraulic controls holding the boom at the desired depth, he can easily undercut pipes or other obstructions, dig right up to foundations. Forward or reverse, the operator can select from a large number of digging speeds . . . going forward, he can dig up to nineteen feet per minute.

The plain fact is, this operator has it pretty good . . . the simplified controls of his Buckeye General Utility Ditcher and the Model 8 Chrysler Industrial Engine powering excavator, dirt conveyor and traction members were practically *made for eac other*. For this manufacturer, lik others, selects his Chrysler Engine equipped to meet his needs Standard or gyrol Fluid Coupling Torque Converter, standard o special dust-resistant air cleaner gasoline, propane or natural-ga burning carburetors, fungus treated or corrosion-resistan electrical systems, all of these wer among the optional equipmen available for his selection.

Chrysler Industrial Power is no expensive. Production-line meth ods adapted to specialized indus trial engine building provide custom-built engine at mass pro duction prices.

See a Chrysler Industrial Engine Dealer for your needs or write us direct: ***Department 85, Industria Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER
Industrial Engines
HORSEPOWER WITH A PEDIGREE

Bituminous Concrete For Runway Extension

(Continued from preceding page)

AASHO method. The next 10 inches is compacted to 95 per cent, and below that to 90 per cent.

The blast-strip pavement consists of 2 inches of bituminous concrete on 4 inches of dry-bound macadam on 100 per cent compacted subgrade. The 3-inch layer of seeded topsoil on shoulders is supported by 100 per cent compacted subgrade.

The Zielinski brothers began work about the middle of last summer and had the $480,000 job completed by November 15. It was one of the first big jobs for the new contracting firm, but they made the dirt fly in a short time. Edward Zielinski took over as Superintendent, Mitchell did the engineering, and John kept a close watch on equipment.

An over-all view of runway paving at Bradley Field, with a plane taking off. *C. & E. Photo*

The first job was to clear the acres of trees and brush from the area. The contractor mounted one shop-designed and two Fleco rakes on Caterpillar D7 tractors. Material was pushed into piles and burned. Dozers and scrapers then stripped the topsoil and stockpiled it for future use.

Excavation

Soil conditions, hauls, and even the weather made the job to order for scrapers. The 310,000 cubic yards of excavation was spread over a wide area and permitted the fast units to maintain highball schedules. Zielinski used two brand-new Cat DW21's with No. 21 scrapers. Heaped capacity ran about 23 yards. Rounding out the scraper brigade were a 15-yard Wooldridge and a 12-yard LeTourneau Carryall. The Wooldridge was pulled by an Allis-Chalmers HD-14 and the Carryall was pulled by a Cat D7. Most of the pushing in the cuts was done with an Allis-Chalmers HD-20.

Average hauls were about 1,500 feet. Production went as high as 9,100 yards per day, and averaged about 7,000 yards. Haul roads were maintained with an International TD-9 tractor pulling a wood and steel drag.

Fill was laid in 6-inch lifts and compacted with loaded scrapers (25,000 pounds per wheel) and a Tournadozer. The latter's tires were filled with calcium chloride and water for extra weight.

Getting 100 per cent compaction on the subgrade was a tough problem for the contractor. Water was pumped from hydrants through 4-inch aluminum pipes to hoses. During the day the fill was hand-hosed and at night sprinklers operated continually.

Pavement

All pavement work was subcontracted to Lane Construction Co. of Meriden, Conn. Stone for the dry-bound macadam was hauled in 10 to 15-ton trucks from a quarry 14 miles away. A spreader laid the stone in 3-inch lifts.

The macadam was graded as follows:

Size	Per Cent Passing Coarse	Choker
2½-inch	100	....
2-inch	90-100	....
1½-inch	35-75	....
1-inch	0-15	....
¾-inch	.	100
½-inch	0-5	90-100
⅜-inch	0-15	....
No. 100	....	10-30

One 3-axle tandem and three 3-wheel Buffalo-Springfield rollers compacted the stone. Each unit was required to roll every 100 square yards for one hour on end. Choker stone was laid on top with a Jaeger spreader and rolled again.

Bituminous concrete was hauled from Lane's plant 20 miles away and laid with the Barber-Greene paver. The four Buffalo-Springfields did the rolling.

Drainage work included about 7,000 linear feet of 12 to 48-inch pipe. About 50 acres adjacent to the runways was fine-graded and seeded. Lateral safety zones totaled about 25 acres, and were rough-graded and seeded.

Personnel

D. H. Steinhoff was Resident Engineer, and K. Liegerot was Chief Inspector for the Corps of Engineers, U. S. Army. The New England Division is headed by Col. L. H. Hewitt, Division Engineer.

Lockie Is Superintendent

J. D. Lockie has been appointed Plant Superintendent by Symons Clamp & Mfg. Co., Chicago, Ill., manufacturer of forms, shores, column clamps, and accessories.

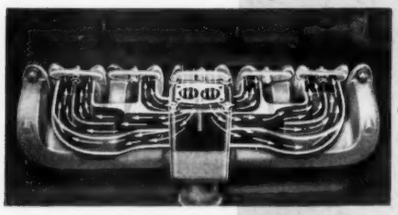
Engineered to Excel

CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD

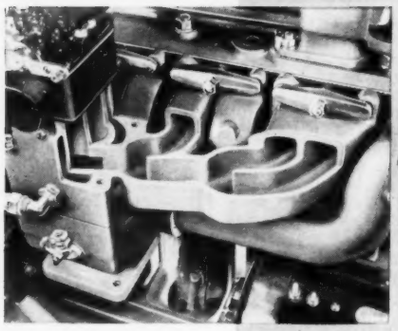
• CONTINENTAL •

RED SEAL POWER

Continental engines owe their steadily-widening use to a reputation for dependability, built up over many years. Dependability, in turn, results in very large measure from long-continued emphasis on engineering details.

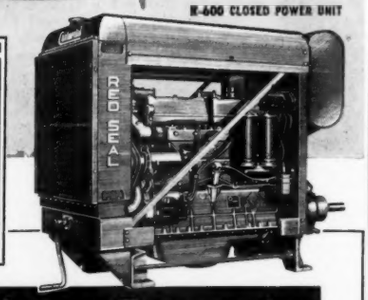


The exclusive Continental system of fuel distribution known as Individual Porting is only one of countless engineering features which join in Red Seal engines to assure power, economy and trouble-free long life.



Intake manifold is cast with separate port for each cylinder. Cutaway view shows the splitters, which are so designed and located as to provide uniform flow of mixture to all ports. Control ledges and re-atomizing edges, not visible in photo, assure complete utilization of even the least volatile "heavy ends" of the fuel.

R-600 CLOSED POWER UNIT



FOR PERFORMANCE, ECONOMY AND STAMINA BORN OF ENGINEERING LEADERSHIP, AND BACKED BY PARTS AND SERVICE FACILITIES THROUGHOUT THE WORLD, STANDARDIZE ON EQUIPMENT WITH CONTINENTAL RED SEAL POWER.

SEE CONTINENTAL EXHIBIT
Booth 1250-A
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Continental Motors Corporation
MUSKEGON, MICHIGAN

BRADFORD TOOLS

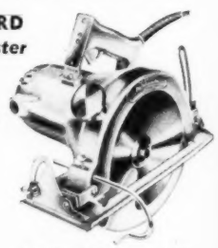
Designed to Save Time on the Job!

Contractors have found that Bradford Tools, designed for precision and stamina, meet today's work requirements with labor-saving efficiency.

BRADFORD *Metalmaster* 6" AERIAL GRINDER

For easy, accurate grinding, wire brushing or polishing all classes of work — from ornamental iron to heavy I-beams. Powerful motor develops 1 HP: has no-load speed of 4000 r.p.m. Ball bearing construction. Equipped with one 6" x 1" x ⅝" hole general purpose wheel. Length 25", net weight 17 lbs. Tool rests and stand available at slight extra cost.

BRADFORD *Metalmaster* 8" SAW MODEL 180



Vertical depth of cut 2-29/32"
Bevel cut at 45: 1-29/32"
Net weight: 17 lbs. 8 oz.

Bradford Saws are better balanced—better built, for easier handling, faster sawing, more accurate work. Two sizes: 8", shown above; and 6", with blade on either side.

Ball bearing construction. Gears are helical cut to give maximum driving power. Powerful 110 volt AC-DC motor. Also available in 220 volt. Mitre attachment, depth adjustment and rip gauge standard equipment.

Ask your distributor, or write for complete details.

The BRADFORD MACHINE TOOL CO.
653 Evans St., Cincinnati, Ohio
Precision Since 1840

Underbase Electrode

A new electrode for the rebuilding of steel parts preparatory to a hard-facing overlay is announced by Stoody Co., 11936 E. Slauson Ave., Whittier, Calif. It is recommended by the manufacturer as an underbase for such parts as drive sprockets, churn drills, shovel-drive tumblers, tractor rollers and idlers, tool-joint shoulders, and clutch jaws.

Stoody Build-Up is an extruded alloy-coated electrode designed to produce an alloy steel deposit of consistent medium hardness of 29-31 Rockwell C under normal conditions. Deposits are affected by heat treatment and will react to abnormal temperature ranges like any other alloy steel.

While the electrode is not a hard-facing alloy and not intended for such applications, it has certain limited uses as a final overlay on equipment where impact is the principal wear factor as in steel shafting, gears, and tractor rails. Deposits can be machined with high-speed tools.

For further information write to the company, or use the Request Card at page 18. Circle No. 8.

Hose Coupling Shop

New hydraulic hose - coupling equipment is announced by Champ Industries, Div. of Hose Accessories Co., P. O. Box 6781, Philadelphia, Pa.

The Champ hydraulic hose-coupling shop includes cut-off, skinning, and hydraulic-press sections. The equipment will make up single or double-braided hose from ¼ to 1¼ inches. Assembly time is said to average about 5 minutes for any length of hose.

For further information write to the company, or use the Request Card bound in at page 18. Circle No. 113.

Batching Plants and Mixers

Concrete mixers, expressway plants, dry-batch plants, aggregate bins, elevators, and conveyors are among equipment shown in a catalog from the L. Burmeister Co., 4535 W. Mitchell St., Milwaukee, Wis. The company's 3 and 4-cubic-yard mixer tilts up so that it pours from one spot, minimizing segregation.

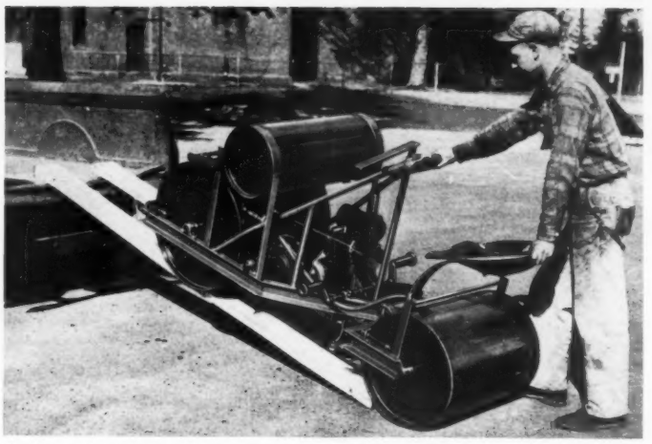
Photographs, detailed drawings, and text describe the company's line.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 146.

Aero Service Subsidiary

A subsidiary company of Aero Service Corp. has been established in Salt Lake City, Utah, it was announced by the company. Aero Service Corp. (Western) will compile topographic maps and photomaps for oil and mining companies located in the west, as well as produce maps for highways, cities, flood control, irrigation studies, and other engineering uses.

The parent company's mapping methods and equipment will be employed. Company officials said that the new Salt Lake City location will bring better service to Aero's western clients.



The Con-Sol roller comes in two sizes—a standard 300 to 1,200-pound model and a heavy-duty 375 to 1,400-pound model. A new feature is the addition of a foot-lever shift for forward and reverse, which leaves the operator's hands free to steer and to operate the throttle. For further information write to Consolidated Industries, Inc., Mixville Road, West Cheshire, Conn., or use the Request Card at page 18. Circle No. 147.

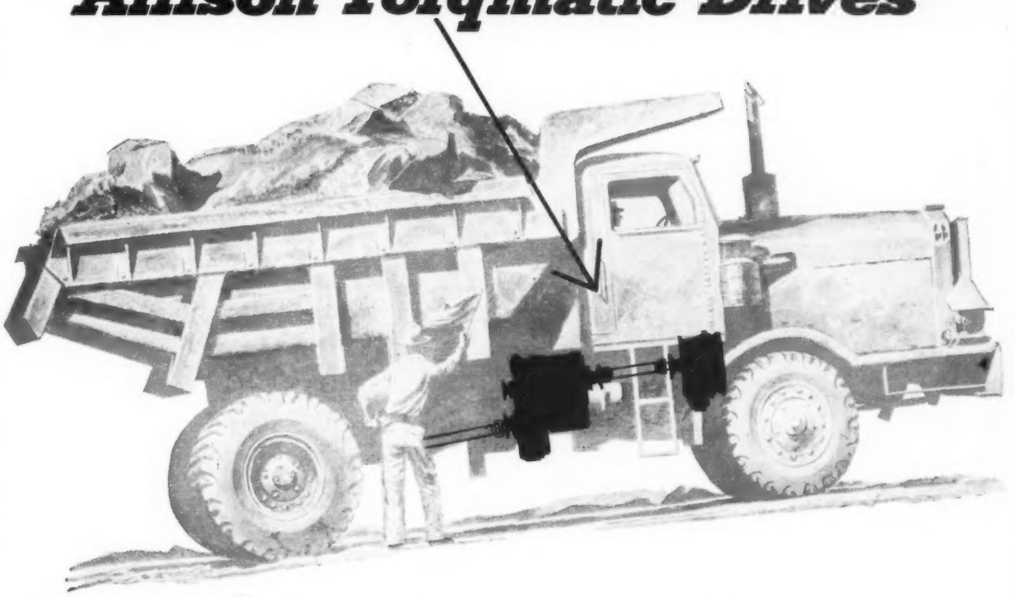
Night School for Field Men

Monday evening was schooltime for the field and office men of the Vermont State Highway Department during the winter months just past. Once a week these men attended instruction sessions aimed at increasing their knowledge of construction and design techniques involved in highway building.

The course was conducted at Montpelier under the direction of F. Carlisle Coates, the Department's construction engineer, who reported that although attendance was purely voluntary and on the men's own time, there had been nearly a full house every week.

Vermont road and bridge specifications were reviewed item by item. Colored film slides supplemented the informal talks on the Department's work, and actual problems were discussed by the older engineers.

Allison Torqmatic Drives



The Team that stretches time between overhauls!

Operators of heavy-duty, off-highway trucks soon find in their cost records that Allison TORQMATIC Converters and TORQMATIC Transmissions extend time between overhauls and help cut repair bills amazingly.

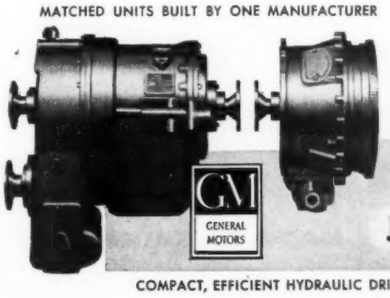
Allison TORQMATIC DRIVES match the engine power to the loads. Maximum engine horsepower can be utilized throughout the entire haul cycle, thus eliminating harmful shocks, lugging and stalling.

TORQMATIC DRIVES also cut operating costs because they take out much of the human element in driving the vehicles—gearshift guess and gearbox clash are things of the past. Allison TORQMATIC DRIVES "quick shift" hydraulically at full throttle by a flick of a simple control lever.

Send for the Allison pamphlet completely describing these Drives and learn more about their broad application to heavy-duty equipment.

ALLISON DIVISION OF GENERAL MOTORS
Box 894CC, Indianapolis 6, Indiana

MATCHED UNITS BUILT BY ONE MANUFACTURER



Allison TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR TRUCKS * CRANES * TRACTORS * SCRAPERS * SHOVELS * DRILLING RIGS

Tractor-Mounted Seeder

A new 5-foot tractor-mounted grass seeder is introduced by the Brillion Iron Works, Inc., Brillion, Wis. It is said to condition the seedbed, sow, and roll in one operation.

The conditioning is done by closely spaced pulverizer wheels of the type used in agricultural equipment. The wheels break the lumps and clods left by tillage, thus forming a finer mulch on which to sow the seed. The unit is said to get into and out of close quarters thus reducing hand labor to a minimum.

The manufacturer points out that another advantage of this type of soil preparation is its showing up low areas. These can be filled immediately, and the quality of the finished job improved.

The seeding mechanism lays the seed directly behind the pulverizer wheels and is followed by a second roller which covers the seed to a ¼-inch depth and firms the soil around each seed.

This view shows the Brillion tractor-mounted seeder, said to condition the seedbed, sow, and roll in one operation.

The unit attaches to popular landscape tractors with the same 3-point hitch that mounts scrapers or disks.

For further information write to the company, or use the Request Card at page 18. Circle No. 5.

Turnpike Accident Study: First Two Analyses

The Pennsylvania Turnpike Commission's investigation into the causes of vehicular accidents on the superhighway (see C. & E., Dec., 1952, pg. 20) has resulted to date in analyses of two of the 45 accident factors scheduled for study during the next year or more. These two factors are speed and the median strip.

Contrary to general belief, the investigators state, high speed is not the main cause of traffic accidents on the Turnpike. The peak of accidents has been found to occur at speeds between 41 and 50 mph for passenger cars and 31 to 40 mph for trucks. Of the trucks involved in accidents, 20 per cent were standing still when an accident occurred.

As to accidents connected with the median strip, these only amount to 8 per cent of vehicles involved in all traffic accidents. Ten per cent of all passenger cars and 5 per cent of all trucks involved in accidents encountered difficulty. because of a vehicle getting into the median strip separating eastbound and westbound traffic lanes.

Drivers are the chief trouble, judging by statistics. Driver error accounts for about 85 per cent of the traffic accidents on the Turnpike, while only 15 per cent are due to mechanical difficulties and unexpected road obstacles. And it looks as if young drivers were the worst offenders. In passenger-car accidents, 32 per cent of drivers were from 16 to 25 years old; 29 per cent were between 26 and 35; and only 8 per cent were 56 years old or over.

The foregoing results of the Joint Highway Safety Research Group's investigation are only preliminaries, and there is still much work to be done. The fact-finding group is composed of the Turnpike Commission and Union Switch & Signal, a division of Westinghouse Air Brake Co., Swissvale, Pa. Working with the group is the American Institute for Research, Pittsburgh, and J. E. Greiner Co., Baltimore, Md. Another subsidiary of Westinghouse Air Brake—Melpar, Inc., Alexandria, Va.—is helping with specialized knowledge of electronics.

Folder on Scaffolding

A 4-page color folder on scaffolding for plasterers, builders, carpenters, bricklayers, and tinsmiths is available from the Superior Scaffolding Co., 5624 Bankfield Ave., Culver City, Calif.

The booklet has drawings and installation-setup pictures of jiffy jacks, shack jacks, flat backs, wale jacks, featheredges, sliding ledgers, folding trestles, stud-scaffold jacks, safety jacks, splice clamps, ledger clamps, rolling scaffolds, and folding mortar-board stands. Technical data is provided on some items.

For further information write to the company and request Catalogue No. 102, or use the Request Card at page 18. Circle No. 71.

HEAVY-DUTY TRENCHER

WITH NEW IMPROVED SELF-CLEANING BUCKET — Capacity ½ yd.

A heavy-duty trench digger, which is designed for a wide variety of trenching for any highlift tractor with hydraulic bucket control.

It will increase the tractor's production from 80 to 50 per cent and is easily attached by one man in 15 minutes.

The Whitestown trencher is equipped with a ½-yard standard bucket. Special buckets, made to individual specifications, may be obtained. It will dig to a depth of 8 feet and dump at a height of 12 feet. This trencher has been in constant use for four years, and has proved to be rugged and satisfactory in every way.

The Whitestown Trencher is now available for use on the following hydraulic controlled tractors:
Allis-Chalmers HD-5G equipped with TS-5 tractor-shovel
Caterpillar D-4 and Trackson HT-4; Oliver with 4-A Lull loader
International TD-6 & TD-9 equipped with new Bucyrus-Erie dozer-shovel
International TD-6, TD-9 & TD-14-A with Hough bulldozer-shovel
Hough Model HM-Payloader; Trojan Loadster, Models LM-75; LC-100-B

● ***Immediate delivery can be made.***

● ***Please specify make of tractor.***

WHITESTOWN TRENCHER CO., INC.

Wood Road, Whitesboro, New York — Phone: Utica 6-2430

A New 13.5 h.p.

CONCRETE CUTTER

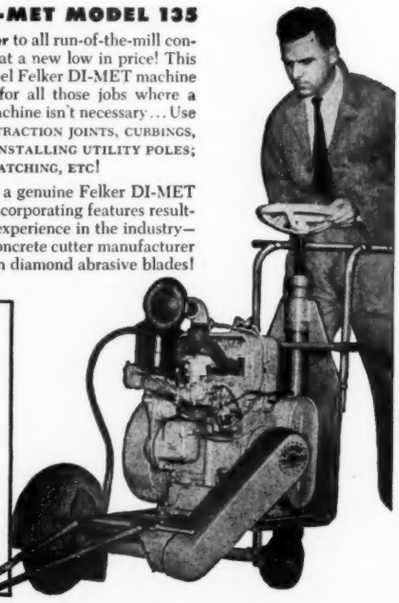
for only **$580.00**

Net f.o.b. factory

FELKER DI-MET MODEL 135

Here's your answer to all run-of-the-mill concrete cutting jobs at a new low in price! This light-weight 3 wheel Felker DI-MET machine is specially built for all those jobs where a big heavy-duty machine isn't necessary... Use it for cutting CONTRACTION JOINTS, CURBINGS, DRIVEWAYS; FOR INSTALLING UTILITY POLES; FOR TRENCHING, PATCHING, ETC!

Now you can own a genuine Felker DI-MET Concrete Cutter incorporating features resulting from years of experience in the industry—built by the *only* concrete cutter manufacturer who makes his own diamond abrasive blades!



FEATURES

EASY HANDLING—3 wheel design with light-weight alloy castings.

BIG BLADE CAPACITY—Utilizes from 8" to 18" diamond wheels. Cuts to 3½" depth with 12" wheel.

SPLIT, HINGED BLADE GUARD—For cutting close to curbs, etc. 12" standard, 18" optional equipment.

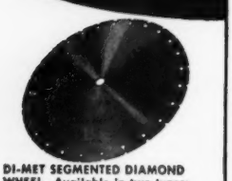
POWERFUL ENGINE—Full 13½ h.p. Wisconsin Model TF gives a surplus of power for every cutting requirement.

PRESSURE COOLANT supplied through external hose connections.

INSTANT BLADE DEPTH ADJUSTMENT with handwheel and screw.

SLOTTED BLADE COLLARS—Powerful coolant ejection completely flushes blade and kerf.

HUSKY SPINDLE—Mounted in Dodge S.C. self-aligning ball bearing pillow blocks. 1¾" single end arbor with keyway.



DI-MET SEGMENTED DIAMOND WHEEL—Available in two types: **STANDARD** for hard, dense, cured concrete. **SPECIAL** for green, uncured concrete and asphalt.

Get ALL the facts on the LOW-COST DI-MET MODEL *135. See your dealer or write us today!*

FELKER DI-MET

FELKER MANUFACTURING CO.

Torrance, California

World's Largest Manufacturer of Diamond Abrasive Cut-Off Wheels and Equipment

Concrete Paving on A 5.4-Mile Relocation

Heavy Local Traffic Condition Eliminated by New Route: Bridge Is Included and River Re-Channeled

By L. H. HOUCK

• RELOCATION of a 5.4-mile portion of U. S. 66 through Missouri to by-pass Waynesville will eliminate numerous short curves and steep grades.

The new route takes off from old U. S. 66 just east of Waynesville, cuts through the variegated limestone bluffs a short distance to the south, crosses the twisting Roubidoux River over a new bridge, and then rejoins the present highway southwest of Waynesville. Total length is 5.4 miles, 1.7 miles of which consists of dual 24-foot lanes with 4 to 150 feet of separation. The balance is a road consisting of a 24-foot pavement with 10-foot shoulders, but a right-of-way has already been obtained to make another divided highway at a later date. The new highway features gentle curves with carefully plotted super-elevations which promote safe and speedy travel.

The establishment of Fort Leonard Wood near Waynesville at the beginning of World War II created a traffic problem, which was never entirely solved until engineers relocated U. S. 66 to by-pass the town. Waynesville itself was ill-equipped to handle the flow of military and tourist traffic flooding a little town whose population in 1941 was less than 500.

The total cost of the highway relocation, including a bridge, was nearly $1,750,000. The project is a part of Missouri's $557,000,000 road-improvement program. Contract for grading and concrete paving went to Perry McGlone Construction Co., of Kansas City, Mo., for $1,141,122.49 and the bridge contract went to Davis Construction Co., Boonville, Mo., for approximately $296,000.

Bridge in Package

Included in the new route is a 745-foot continuous I-beam and plate-girder bridge over the Roubidoux River, which had to be given a channel-relocation treatment. This river sometimes goes on a flood spree and surrounds the town of Waynesville with water. Until it simmers down it is not likely to recognize its proper channel under existing bridges, so Missouri Highway Department engineers incorporated a new channel to insure its speeding under the new bridge instead of wandering about the country. This channel relocation required 85,000 cubic yards of excavation, consisting of a 4-inch top layer of sandy silt, followed by succeeding layers of sand and gravel. The excavated material was put to good use in a fill on the south side of the river. This excavation was included in the McGlone contract and the work was done by a 2½-yard Northwest crane which loaded into both bottom and end-dump Euclids with a 2½-yard dragline bucket. The same crane was put to work later at the batch plant.

(Continued on next page)

Cement trucks haul bulk cement 13 miles, and dump it into an elevator at the Johnson silos.

A MESSAGE TO CONSTRUCTION ENGINEERS

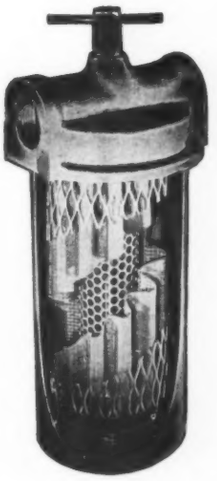
SUMP PUMP (Cutaway)

An important phase of the construction industry is the need for dependable and economical maintenance of equipment.

We all know from experience that poor equipment saves no one money. There is no before hand calculating the cost of delays in completing a job and in lost opportunities. Equipment that is not dependable does not fit into the modern construction picture.

For these reasons, construction engineers are advised to concentrate much effort upon preventive maintenance.

In equipment where filtration is a problem, remember Marvel Synclinal Filters for protecting liquids in all hydraulic and low pressure systems.



LINE TYPE (Cutaway)

2½ TIMES MORE *ACTIVE* FILTERING AREA!

with

MARVEL *Synclinal* FILTERS

MARVEL FILTERS are available in both sump and line type models. Individual capacities from 5 to 100 g.p.m. and in mesh sizes from 30 to 200. Both types may be easily disassembled, cleaned and reassembled by any workman. Line models operate in any position and may be serviced without disturbing pipe connections. You can depend on MARVEL FILTERS for efficient preventive maintenance.

WATER FILTERS

Both our sump and line types are NOW designed for use in all water filtering applications. No changes have been made in the basic Synclinal design.

Write for Complete Information—Specify Oil or Water

Meets J.I.C. Standards

MARVEL *Engineering Company*

627A-E3 WEST JACKSON BOULEVARD, CHICAGO 6, ILL.

Concrete Paving

(Continued from preceding page)

Grading and Excavation

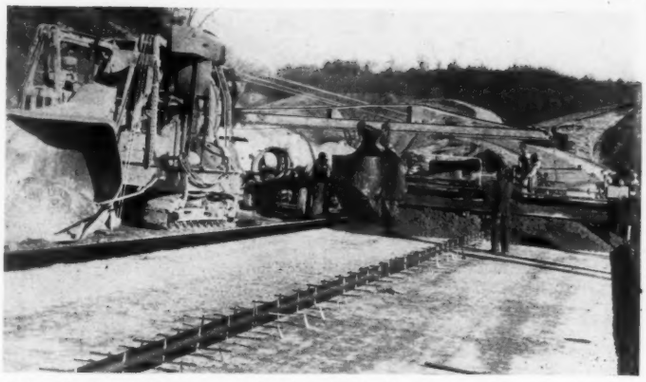
Contract for grading and paving was let early in 1952 and the contractor went to work March 1. Cutting a new road through this kind of terrain means blasting a way through limestone bluffs. Some of the cuts were 70 feet deep and some of the fills matched. The formation was largely dolomite of the limestone family with easy shattering characteristics but the "ease" was not dependable.

The Ozarks, with numerous springs, caves and rock outcroppings, are a tourist attraction, but can be a nightmare to road builders. The limestone bluffs are sometimes surprise packages of conglomerate granite, schist, gneiss and quartzite, wrapped in scenic cuesta escarpments under a patina of age. This rock job was no exception.

All the rock sections had to be broken with dynamite and the contractor used two Ingersoll-Rand wagon drills on the blast holes. The rock was loosened up in 10 and 20-foot benches. The broken rock was loaded into 16-yard bottom-dump Euclids with a 2½-yard Northwest shovel. Air for the wagon drills and jackhammers was provided by a 600-cfm Ingersoll-Rand air compressor.

Excavated material went into the fills, which about matched the cuts so that no borrow pits or spoil piles were necessary. The dirt portions of the excavation were handled with six LeTourneau Carryalls which were push-loaded and pulled by D8 Caterpillar tractors.

Fills were compacted with sheepsfoot rollers and wobble wheels. On subgrade lifts final compaction was made with two Galion rollers with water ballast. One of the rollers was a 5-ton and the other a 7-ton.



A Koehring 34-E Twinbatch paver deposits a bucket of concrete in front of a Blaw-Knox spreader on the U. S. 66 relocation project in Missouri.

Subgrade and Forming

The natural subgrade was left high for fine-grading with a planer which cleaned up the excess between forms and dumped it outside.

More than 4,000 linear feet of Blaw-Knox steel 9-inch forms were on hand and a minimum of 500 feet was laid ahead of the paver except when the paver finished at the eastern bridge approach. Forms were set by 5 men and a foreman. Pins were hand-driven and since the paver worked outside the forms the joints could be laid out well in advance, forms oiled and subgrade fine-graded and rolled. Subgrade was checked with a template which was drawn through the forms.

Paving Joints

The longitudinal center joint was 16-gage x 7½-inch steel supported on ½-inch deformed bars 30 inches long and set on 30-inch centers with end support from flat galvanized bar chairs. Center steel was pinned down to subgrade, and the top was held to ½ inch below the surface of the pavement.

Only four expansion joints were required and these were located at 40 and 80 feet from each end of the new bridge. Each joint was 2 inches wide and was filled with bituminous material.

Contraction joints were placed at

JUMBO "HEET-MASTER" KETTLES
375-500 GAL. CAPACITY
By Aeroil

OUTSTANDING FEATURES:
- "Hot-Stuff" in 15 minutes!
- Trails at any speed!
- Short turning radius!
- Tandem axle arrangement!
- Low loading height!
- Complete Rockwool insulation!
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- Rugged, durable construction!

AEROIL PRODUCTS COMPANY, INC.
75 WESLEY ST., SOUTH HACKENSACK, N. J.
CHICAGO • DALLAS • SAN FRANCISCO • LOS ANGELES • SEATTLE
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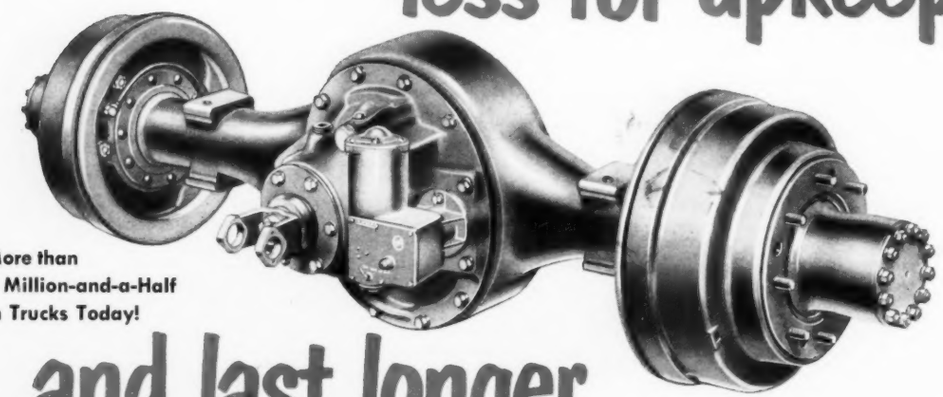
Eaton 2-Speed Axle Trucks cost less to run, less for upkeep,



More than a Million-and-a-Half in Trucks Today!

and last longer

Eaton 2-Speed Axles make available *twice* the conventional number of gear ratios, permit engines to run in their most efficient and economical range at all times, reducing stress and wear on vital parts. Eaton's exclusive planetary design, forced feed lubrication, and extra rugged construction cut maintenance cost. Ask your dealer why—working or trading—Eaton 2-Speeds make your trucks worth more.

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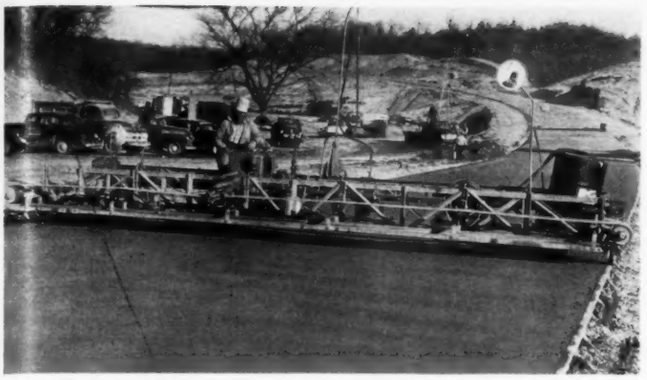
PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



A Heltzel Flex-Plane machine carries a mechanical broom in front, and a spray unit for Hunt membrane curing at the rear.

20-foot intervals. This was done from a unit which rode the form rails immediately behind the mechanical float. A slot 3 inches deep was cut transversely with a steel blade having a serrated edge. The slot in the fresh concrete was then filled with asphalt-impregnated felt strips set flush with the top of the pavement.

Batching Plant

The batching plant was located near the spot where the new relocation joined the east approach of the new bridge and adjacent to a gravel road that led to the old U. S. 66 pavement a short distance away. The plant was laid out so that all loading and unloading could be accomplished on a drive-through basis.

This location was chosen because the cement, sand, and rock had to be trucked from the nearest rail point at Crocker, 13 miles away. Trucks made the short run on gravel to U. S. 66, a mile east through the main part of Waynesville and then north of State Route 17, which meant crossing the heavy U. S. 66 traffic twice on each round trip.

Cement in bulk was shipped by rail to Crocker from two St. Louis companies—the Missouri Portland Cement Co., and the Alpha Cement Co. Covered trucks owned by the contractor brought the cement to the batch-plant bins, where it was dumped in a hopper at the base of the silo for elevation to the top. One silo held two carloads and the other silo, one carload.

Aggregate rock in 1 and 2-inch sizes came by rail to Crocker from the rock plant of Joseph Griesemer, 1½ miles east of Springfield, Mo. Rock was trucked to the stock pile at the batch plant. Sand was shipped by rail to Crocker from Pacific, Mo. Railroad cars were unloaded into the trucks with mechanical elevators.

A 2½-yard crane with a 45-foot boom was moved on top of the aggregate pile in the center so it could reach each size of rock with equal facility. From this vantage point it loaded a 2-bin wooden elevated hopper under which the trucks drove to receive their loads by gravity.

The contractor operated a mixed fleet of 12 to 22 batch trucks. Each had a capacity of 37.3 cubic feet. The layout and loading routine was for trucks to drive through for rock, sand, and cement and then make a left turn onto the site road which ran on the north side of the paver which was depositing concrete on its south side. The truck headed west, drove past the paver, stopped, then backed up to the lowered skip of the paver.

One man attended to the unloading, banging the truck with a sledge hammer to make sure all material went out. A chain and a weight inside the skip agitated the material and kept the skip clean.

Paving Plant

The paver was a Koehring 34-E

(Concluded on next page)

WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY
P. O. Box 1198 Terre Haute, Indiana

"We're through experimenting!
...Sinclair Lubricants
suit us to a T"

...says Al DeFeo, Sette Engineering Co., Paramus, N. J.

Mr. DeFeo's job as Treasurer and Purchasing Agent is to see that maintenance costs on the company's heavy excavation and road building equipment are kept at their lowest figure. He reports: – "Our books give us an exact picture of how our equipment is holding up . . . About 10 years ago we experimented with different brands of lubricants, looking for one that would suit our equipment requirements to a 'T'. After trying Sinclair lubricants, *our figures proved* we finally had the right products. With Sinclair TENOL® and Sinclair LITHOLINE® Multi Purpose Grease we cut maintenance costs to a new low. Experimenting proved one thing to us – Sinclair is tops."

To cut *your* maintenance costs, try Sinclair Lubricants. Contact your local Sinclair Supplier or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

For your tough jobs

SINCLAIR LUBRICANTS

Concrete Paving

(Continued from preceding page)

Twinbatch with a 35-foot boom and a dual-gated bucket. Located outside the forms no drip was necessary. A trailer-mounted 2,000-gallon water tank was towed behind the paver, both of which were outside the forms. Water came from the municipal supply at Waynesville. Concrete was mixed a minimum of 60 seconds.

Average rate of pour was about 700 feet of 24-foot width per day, the highest day's production being chalked up as amounting to 1,684 feet.

Finishing

A Blaw-Knox spreader followed the paver and rode the tops of the steel forms. Behind it was a Jaeger-Lakewood dual-screed finisher with one Jackson vibrator mounted on the front at each end. Then came a small rail-wheeled unit for cutting the transverse contraction joint, and a Koehring mechanical bull float. About 100 feet in the rear was a Flex-Plane machine equipped at the front with a mechanical broom which gave the floated surface a broom finish. Spray heads and pump for the Hunt Process membrane cure were carried on the rear of this machine, and the spray was applied immediately after brooming.

Before the brooming a small crew hand-finished the surface. Edges were also grooved. Forms were stripped after 12 hours and pins pulled with a high lift.

Quantities and Personnel

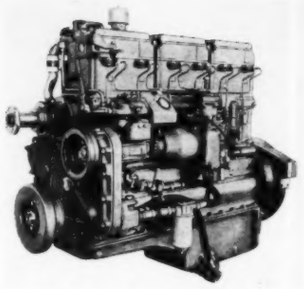
Rock excavation	207,110 cu. yds.
Dirt excavation	490,025 cu. yds.
Channel-change excavation	85,000 cu. yds.
Concrete in bridge and culvert	2,656 cu. yds.
Concrete in pavement	98,593 sq. yds.

For Perry McGlone Construction Co., Earl Fizer was General Superintendent and Gordon Johnson was Paving Superintendent. The contractor had a crew of 70. The Missouri State Highway Department was represented by W. R. Christeson, Project Engineer. Rex M. Whitton is Chief Engineer; J. L. Brown, Springfield, Mo., Division 8 Engineer; J. J. Corbett, Engineer of Construction; and V. W. Enslow, Bridge Engineer.

Esco Branch Opens in Utah

On February 1, Electric Steel Foundry Co., Portland, Oreg., opened a new branch in Salt Lake City, Utah, to handle Esco customers in Utah, Colorado, southeast Idaho, and the southwestern part of Wyoming.

Garland T. Allen, the newly appointed Manager of Sales, will make his headquarters at 1455 S. 2nd W., Salt Lake City.



The Cummins Model HRBB-600 diesel engine has been increased from 175 to 180 hp with no increase in engine weight. For further information write to the Cummins Engine Co., Inc., Columbus, Ind., or use the Request Card at page 18. Circle No. 149.

Concrete Pipe Associations Hold Annual Meetings

Some knotty points confronting highway engineers and manufacturers of concrete pipe were ironed out at the 45th Annual Convention of the American Concrete Pipe Association and the 3rd Annual Convention of the American Concrete Pipe Agricultural Association held in Dallas, Texas, last February.

Highway culverts were a subject of discussion at the ACPA 3-day meeting, which was attended by some 350 persons. Dr. Lorenz G. Straub, Director of the St. Anthony Falls Hydraulic Laboratory of the University of Minnesota reported on the results of tests of culverts on steep slopes and emphasized the importance of designing a rounded entrance for such culverts. The concrete-pipe industry came in for some detailed discussion, and Col. R. R. Litehiser, Chief Engineer of the Ohio State Highway Department's Testing and Research Laboratory, described Ohio's experience in testing concrete pipe.

Ivy H. Smith of Jacksonville, Fla., was re-elected President of the ACPA for 1953. New Board members include: Vice Presidents Harry W. Heath, Carl A. Bluedorn, and A. W. G. Clark; Secretary David H. Decker; Treasurer J. D. Mollendorf; and Directors Peter Van Kuran, R. B. Carroll, R. A. Norman, A. B. Metcalf, and H. E. Eschenbrenner, Jr.

At the American Concrete Pipe Agricultural Association's meeting, E. L. Johnson, Chairman of the Association's Specification and Technical Problems Committee, conducted the sessions. Bureau of Reclamation representatives included Howard C. Curtis, head of the Canals and Pipelines Section; Frank E. Rippon, Assistant Chief of the Canals Branch; and Lewis H. Tuthill, Bureau Concrete Engineer.

More than 75 persons gathered to hear Mr. Tuthill discuss "Some Technical Items Relating to Concrete Pipe", and Mr. Curtis' paper entitled "Bureau of Reclamation Specifications for Concrete Pipe".

The ACPAA elected new officers for 1953 as follows: President—J. W. Forter (re-elected for a second term); Vice President—R. W. Liston; Secretary—G. F. Lillie (re-elected); and Treasurer—Wm. B. Freeman (also re-elected). R. R. Reynolds was made a member of the Board to serve with re-elected members Earl H. Eby and G. D. Williamson.

IT'S JUST THAT SIMPLE. There's only one reason in the world why 2 out of 3 wire rope users in the excavating and construction field prefer Roebling wire rope . . . *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your machines.

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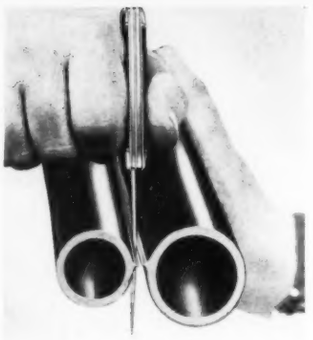
A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Double Plastic Pipe For Jet Water Pumps

Two plastic pipes extruded simultaneously and joined in perfect alignment with a thin web of the same plastic material can be obtained from the Yardley Plastics Co., 142 Parson Ave., Columbus, Ohio. The manufacturer points out that instead of having to stock two or more sizes of plastic pipe for jet-well jobs the contractor can now get the necessary twin piping in one coil.

Twinduit is said to work into the well without pinching, forcing, or binding. Two pipes in the same coil reduce handling time. The light



weight of plastic (approximately one-eighth the weight of metal) also speeds up installation. Long continuous lengths of flexible plastic pipe reduce costs by eliminating joints, while the interior surface of plastic pipe is said to produce less frictional loss than other commercial pipe.

The plastic pipe resists rot, rust, and electrolytic corrosion, the manufacturer claims. Twinduit is made in three sizes: 1 x 1¼ inches, 1¼ x 1¼ inches, and 1¼ x 1½ inches. Coils come in 200 and 240-foot lengths. The manufacturer also produces a complete line of fittings for plastic-to-plastic and plastic-to-metal connections.

For further information write to the company, or use the Request Card at page 18. Circle No. 109.

Data on Chain Saw

A 29-pound one-man chain saw with a 5-hp engine is discussed in new literature available from the Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill. The saw has an automatic clutch that keeps the engine from stalling when the chain is stopped.

The cutting bar can be indexed 360 degrees for sawing at angles. Bars are available in sizes from 18 to 54 inches.

An earth auger and handle bars are among attachments covered.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 151.

DISTRIBUTORS

ALABAMA—Tractor & Equipment Co., Inc., 4402 First Ave. N., Birmingham 1. Ray-Brooks Machinery Co., 2573 W. Fairview Ave., Montgomery; P. O. Box 387, Mobile.

ALASKA—Philpott Equipment Co., 573 Dexter Horton Bldg., Seattle 4, Washington.

ARIZONA—Lively Equipment Co., Albuquerque, N. M. State Tractor & Equipment Co., 407 S. 17th Ave., Phoenix.

ARKANSAS—Euclid-Memphis Sales, Inc., Memphis 2.

CALIFORNIA—Geo. H. Philpott Co., Inc., Emeryville; 339 W. Maple St., Monrovia.

CANADA—Dietrich Collins Equipment Ltd., 890 E. W. Marine Dr., Vancouver 14, B. C.

Ferguson Supply Alberta Ltd., Calgary, Edmonton and Lethbridge, Alberta.

G. H. Godsall Equipment Ltd., 28 Jackes Ave., Toronto; P. O. Box 187, Port Arthur, Ontario; P. O. Box 69 NDB., Montreal, Que.

Maritime Newfoundland Agencies Ltd., P. O. Box 822, Halifax, N. S.

COLORADO—Constructors Equipment Co., 3707 Downing St., Denver 5.

CONNECTICUT—The W. I. Clark Co., 2195 Dixwell Ave., New Haven.

DELAWARE—L. B. Smith, Inc., Camp Hill, Penna.

FLORIDA—Florida-Georgia Tractor Co., 2800 W. Beaver St., Jacksonville; 2418 State Rd., Lakeland; 3139 No. Miami Ave., Miami; 1400 S. Orange Blossom Trail, Orlando; New Quincy Highway, Tallahassee; 216 S. 12th St., Tampa.

GEORGIA—Tri-State, Inc., 880 Glenwood Ave. S.E., Atlanta 1; East Side Highway, Macon; Olive Rd., Augusta; 712-14 No. Washington St., Albany.

HAWAII—Grace Brothers, Ltd., 770 Ala Moana Road, Honolulu 10, Hawaii.

IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 No. 4th St., Pocatello.

ILLINOIS—Euclid-Chicago Co., 6027 Northwest Highway, Chicago 31.
Euclid Sales & Service, Inc., St. Louis 10, Mo.

INDIANA—Euclid-Chicago Co., Chicago 31, Illinois.
Reid-Holcomb Co., 1515 Kentucky Ave., Indianapolis 31.

IOWA—Herman M. Brown Co., Des Moines, Cedar Rapids and Sioux City.
Fehrs Tractor & Equipment Co., Omaha 2, Neb.

KANSAS—The G. W. Van Keppel Co., Kansas City 8.

KENTUCKY—Euclid-Kentucky, Inc., 3900 Crittenden Drive, Louisville.

LOUISIANA—Euclid-Memphis Sales, Inc., Memphis 2.

MAINE—H. A. Burkitt, Inc., Route 1, R.F.D. 2, South Portland.

MARYLAND—Rish Equipment Co., Clarksburg, W. Va.
L. B. Smith, Inc., Camp Hill, Penna.

MASSACHUSETTS—Clark-Wilcox Co., 116 Western Ave., Boston 34.
The W. I. Clark Co., New Haven, Connecticut.

MICHIGAN—W. H. Anderson Co., Inc., 47 West Seven Mile Rd., Detroit 3.
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MINNESOTA—The Euclid Road Machinery Co., Highway 169 West, Hibbing.

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NORTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

OHIO—The W. W. Williams Co., 835 Goodale Blvd., Columbus 8; 18301 Brookpark Rd., Cleveland 11; 914 Main St., Cincinnati 2; 1260 Conant St., Toledo (Maumee).

OKLAHOMA—Butler-Sparks Equipment Company, Oklahoma City and Tulsa.

OREGON—Intermountain Equipment Co., Boise, Idaho.
P. L. Crooks & Co., 2145 N.W. Pettygrove St., Portland.

PENNSYLVANIA—Atlas Equipment Corp., 635 Ridge Ave., Pittsburgh 12.
Standard Equipment Co., 152 Horton St., Wilkes-Barre; Hepburn & Lycoming Sts., Williamsport.
L. B. Smith, Inc., Camp Hill (Harrisburg); 29th & Montgomery Avenue, Philadelphia.

RHODE ISLAND—Clark-Wilcox Co., Boston 34, Mass.

SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.

SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

TENNESSEE—Euclid-Memphis Sales, Inc., 188 E. Butler Ave., Memph's 2.
Power Equipment Co., 1218 Island Home Ave., Knoxville; 600 W. Manning St., Chattanooga; 131 Clay St., Kingsport.

TEXAS—The Euclid Road Machinery Co., 1007 Levee St., Dallas 2.
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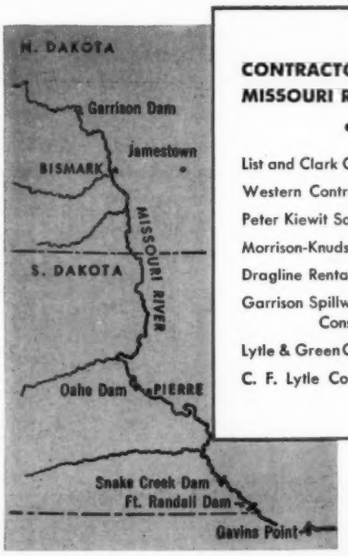
An 11 yd. shovel loads 50-ton Rear-Dump Euclids in just over a minute at Ft. Randall Dam.



CONTRACTORS ON THE MISSOURI RIVER DAMS

- List and Clark Construction Co.
- Western Contracting Corp.
- Peter Kiewit Sons Co.
- Morrison-Knudsen Co.
- Dragline Rental Co.
- Garrison Spillway Constructors
- Lytle & Green Construction Co.
- C. F. Lytle Construction Co.

The six big dams now under construction on the Missouri River comprise the largest earth moving project ever undertaken. More than 200 million cubic yards of earth and rock will be loaded, hauled and placed for these flood control and power dams in North and South Dakota.

At Oahe Dam, which will be the world's second largest earth fill dam, and also at Gavins Point and Jamestown Dams, 100% of the earth hauling equipment is Euclid. The contractors working on the other three projects—Fort Randall, Snake Creek and Garrison—are also using more "Eucs" than all other earth moving units combined.

The Euclid team that's helping to harness "Big Muddy"—Rear-Dumps, Bottom-Dumps, Loaders and Scrapers—gets the job done on schedule at the lowest cost per yard. That's why the contractors are using and depending upon "Eucs" to the tune of 89% of all their earth moving equipment. There are over 200 Euclids, ranging in capacity from 15 to 50 tons, making the dirt fly on these jobs.

Want facts and figures that show how and why "Eucs" move more loads per hour at more profit per load?

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

"Lift-Up" Buildings Enlarge University

Student Union Building With Two Dormitories Built Quickly by Plan Developed in Texas

• THE Youtz-Slick lift-up method of building construction, developed at the Southwest Research Institute at San Antonio, Texas, was used to good purpose at Trinity University in that city. A new student union building, along with a men's dormitory, women's dormitory, and a PX building, were included in the work undertaken by G. W. Mitchell, general contractor. The method was used in the construction of all the buildings.

The method in brief consists of first placing the floor slab of concrete on its permanent fine-grade, waxing its surface, and pouring the roof slab directly on top of the floor. The slab is then raised by hydraulic jacks anchored to the top of steel-supporting columns, and when it reaches the proper height, steel wedges or collars are welded to the support column to give the slab its permanent support at these points. Walls are then built more or less in the usual manner, and the various lift-up slabs are concreted together with conventional support from below.

Architects Bartlett Cocke, O'Neil Ford, Harvey P. Smith, and Consultant William W. Wurster designed the buildings for the University management. Engineers Frank T. Draught and Fred N. Severud also aided in the design.

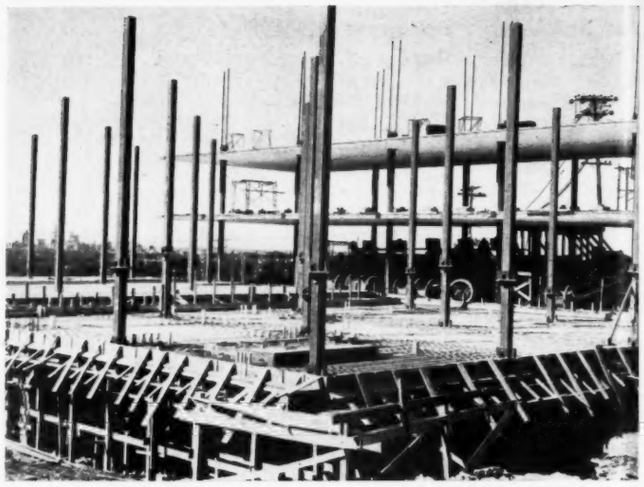
Student Union Building Biggest

The Student Union Building, biggest of the structures, overlooks the San Antonio skyline from a prominent position on the crest of a low bluff, and is directly opposite Alamo Stadium on Stadium Drive on the campus. This building consists of a 116 x 117-foot 2-story section, flanked by a single-story wing, 250 x 45 feet. Simplicity, beauty, and low cost have been achieved through the use of red brick and glass for the exterior walls, and yellow-pigmented concrete for floors. The top of each slab, finished off with yellow pigment, makes the floor of the next story. The roof slab is, of course, left uncolored.

The Student Union Building houses an auditorium, a large cafeteria, and miscellaneous offices. With three of the exposed sides on the main building glassed in, people in the cafeteria have an excellent view of San Antonio's majestic skyline and the surrounding country.

How Slabs Are Constructed

It was necessary on the Student Union Building, before starting the first slab, to gouge a basement through hard limestone and mixed material. Trucks, hand labor, two Joy compressors and four Sullivan pneumatic guns equipped with moil points were used as the material was removed. Two spots were so hard that drill steel, rock bits, and powder had to be used. The shots were very lightly placed so that none of the surrounding buildings around the campus would be shaken or damaged. Spread footings, concrete columns, and the basement walls were then built up by con-



Several of the lift-up slabs, already raised, for the Student Union Building at Trinity University in San Antonio, Texas. Steel columns for the support of the slabs are shown in the foreground. The skyline of San Antonio is visible in the background. *Ray Day Photo*

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rubber tired versatility can pay off for you...

M-R-S 190 switches from scrapers to rippers, compacting rollers, machinery trailers, etc. in only minutes!

Make the most of your equipment investment by taking advantage of M-R-S greater production and versatility. Not only will you profit by outstanding self-loading production made possible by M-R-S exclusive WEIGHT TRANSFER, but also extra versatility that keeps all your equipment working. You'll save in another way, too, with M-R-S you can make the switch to high speed rubber using the four wheel scrapers you already own.

When there's ripping to be done, machinery trailers or compacting rollers to be powered, or other important utility work required, it only takes minutes to switch your M-R-S 190 from scrapers to other attachments right on the job.

If it's bigger profits you're after, you'll be wise to specify the M-R-S 190.

THE EMBLEM OF DEPENDABILITY M-R-S MANUFACTURING COMPANY

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ventional methods, using wooden forms, plywood facing, and Universal tie bolts around the square columns. The first slab was then supported on wooden 4 x 4's, spaced at 6-foot centers, while it was placed.

On the other buildings, the site was simply fine-graded and a sand cushion was placed to carry the initial slab.

Prior to placing the concrete for the first slab, steel support columns, consisting of four 4 x 4 x ½ angles welded to form a square steel column, were anchored by four bolts to a leveling plate on top of the various concrete spread footings. These columns, on 20-foot centers in a grid, were designed to give the slabs their permanent support and the jacks their temporary support while the slabs were raised. This steel was placed and checked very carefully, because heavy steel collars embedded with the slab concrete and reinforcing steel had to raise the columns during the lift. And the 4,250-square-foot slabs, weighing about 225 tons per lift, had to be raised up true through 12 supporting columns per lift.

Bricklayers quickly build the outside walls of the finished building as soon as the concrete slabs are in place. *Ray Day Photo*

A sequence of operations was carefully worked out, like checkers or chess, so that slab areas would always be accessible to concrete trucks at any stage of construction. There were three main lifts in the main portion of the Student Union Building.

Each slab was poured by truck mixers, operating from the commercial plant of Turner Concrete Co. of San Antonio. The floor slabs were all 6 inches thick, with the concrete placed solidly around the various columns. The concrete was placed directly from the truck mixers as far as the spouts could reach, and then a group of 6 CMC concrete buggies was used to move the material to its proper position. The mix is a 3,000-pound at 28-day concrete, using pozzolith, cement, sand, and 1½-inch-minus aggregates.

The surface of the floor slab was then carefully steel-troweled, and the yellow pigment put in at that time. Sealtex membrane-curing compound was applied immediately after the surface was finished, and a special powder, developed to help the wax break the bond with the next slab, was applied. It usually took 3 to 4 days to set the reinforcing steel in place for the next pour. This reinforcing steel was joined to the heavy steel collar at each column which slid up the steel walls.

The second-deck slab on the Student Union Building was 10 inches thick, while the roof slab was 9 inches thick. On the other buildings, both 9 and 10½-inch slabs were built. The Student Union Building, with floor, first deck, and roof slabs, had a 3-tiered concrete "sandwich" in position before any slabs were raised. A minimum of 14 days was required before any of the slabs could be raised.

Slabs Lifted Bodily

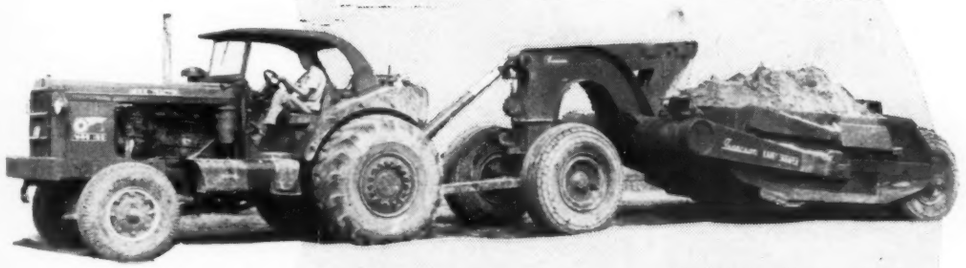
The mechanical lifting of the slabs was done by Tex-Star Co. of San Antonio, using patented equipment. Lifting equipment consisted of a small hydraulic jack—at each column—powered by a 10-hp motor with heavy steel-lifting rods, threaded, to raise the slab. The rods extended through the steel collars at the columns, and were secured with a heavy nut. It usually required about one day to set the equipment up for a lift, one 8-hour shift to raise the roof slab, and about 4 hours to raise the second-floor slab. The slabs were simply raised bodily, and when they had reached the proper elevation, steel lugs or plates were welded to the support columns directly below the main collar. The jacks were then released and the slab was in place to stay.

Bricklaying, the installation of glazing, and such minor items as utilities and so on were installed by conventional methods to round out the interesting buildings. Later on, when landscaping is done, they will become an integral part of one of the most distinctive college campuses in the south. The buildings

(Concluded on next page)

M-R-S 190 WITH 275 H.P. engine serves efficiently as prime mover for large machinery trailer.

IN A MATTER OF MINUTES M-R-S 190 switches from scrapers to a giant ripper right on the job.



M-R-S 190 SELF-LOADS 12 yard struck scraper with 27540 pounds of clay loam soil in 150 feet and 90 seconds—by use of exclusive WEIGHT TRANSFER.

LARGE 19.2 YARD STRUCK SCRAPER is *Pusher-Loaded* to capacity with M-R-S 190 serving as prime mover.

"Lift-Up" Buildings Enlarge University

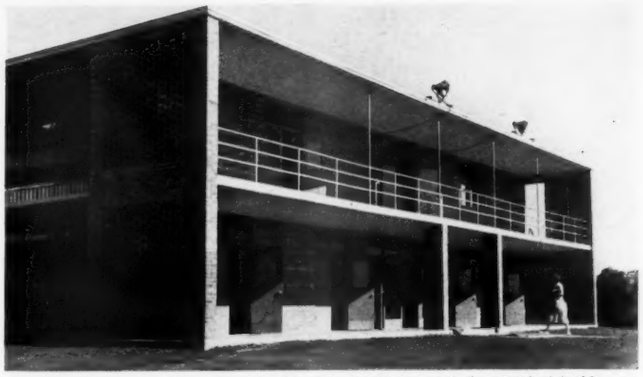
(Continued from preceding page)

were completed in time for the 1952 fall semester.

Bigger Spans Soon

Improvements to the Youtz-Slick method are now being worked out at Southwest Research Institute which, officials say, will soon see 40 x 40-foot spans between columns. Experiments have also been successfully concluded for post-stressing the concrete slabs after construction, which is expected to reduce weight and make a substantial saving on reinforcing steel.

The Youtz-Slick method was recently used on the construction of a 288 x 296-foot warehouse for Handy-Andy Stores, Inc., a grocery chain of San Antonio. Located on a 25-acre tract of land near the Coliseum in East San Antonio, the 109,000-square-foot building was occupied in June, 1952, after being started only 6 months before. Officials of the grocery chain estimate that $270,000 was saved in its construction over conventional methods, and final costs, including air conditioning, were $4.30 per square foot, even though 15,000 square feet of the building is devoted to modern office space. This building utilized some of the variations the lift-up method makes possible, including expansion joints between the partitions and main walls to permit free movement of the exterior shell of the building without damage.



Contemporary exterior designs are possible with the lift-up method: a finished building on Trinity University campus is an example. *Ray Day Photo*

Other buildings have recently been completed with this method, including some in Canada and many of the states in the U. S. California now has two jobs under way, and an important addition has been made in Kansas City, Mo., by using the method.

It is a certainty that the lift-up method made beautiful and low-cost engineering design possible for the Trinity University structures.

All field work from the contractor's angle was under the supervision of B. H. Grothues, General Superintendent.

Book on Construction Costs

"Estimating Construction Costs," by R. L. Peurifoy, Professor of Civil Engineering at A and M College, Texas, is a new volume designed for the student of civil engineering and architecture. It provides a lucid understanding of the principles of estimating the cost of engineering projects and the methods for the preparation of detailed estimates.

There is a breakdown of costs into parts, which are treated individually. The book covers costs of materials, equipment, and labor for a variety of projects. Included are production rates as a guide to the estimator. The most recent advances and special topics are examined in detail. Numerous tables and illustrative material accompany the text.

The book is published by the McGraw-Hill Book Co., and the price is $5.50.

Booklet on Concrete Plants

A booklet on concrete plants is available from The C. S. Johnson Co., Champaign, Ill. The brochure shows equipment including overhead bins, weight-batching machinery, cement handling and storage facilities, aggregate handling and storage facilities, and concrete-mixing units for ready-mix plants. The booklet discusses the chief factors in the selection of the right combination for a particular need.

The company makes central-mix, transit-mix, and concrete-products plants.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 87.

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Bigger Payloads

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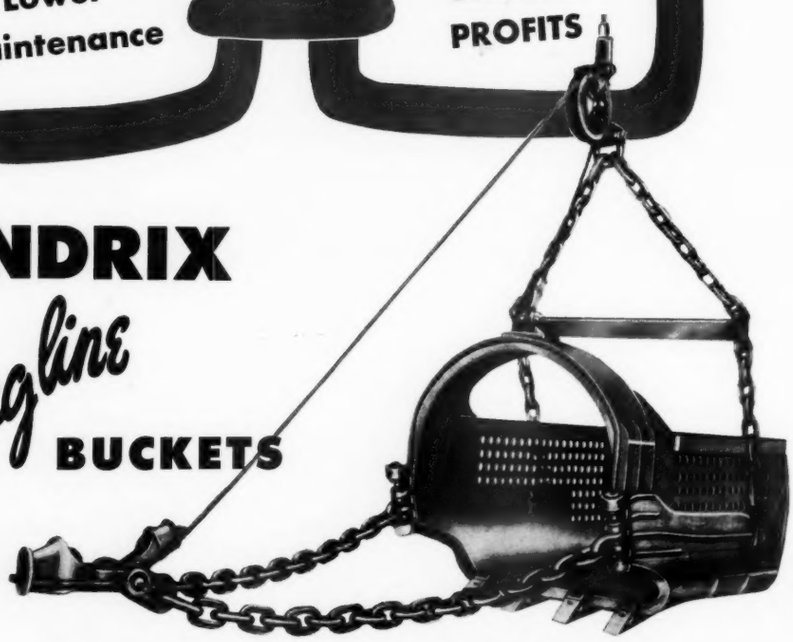

3/8 to 40 Cu. Yds.

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HENDRIX Lightweight DRAGLINE BUCKETS

Hendrix Buckets Also Available Without Perforations On Special Order Only

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MANSFIELD – LOUISIANA

ASSEMBLE SAWHORSES Quicker . . . Easier . . . Better WITH HEAVY-DUTY DALTON Fully Mechanical SAWHORSE BRACKETS

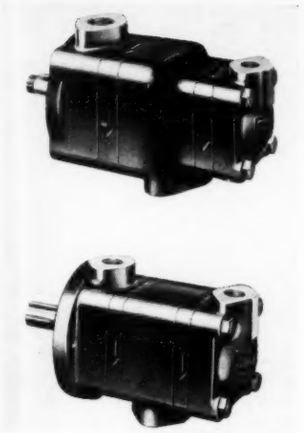
No Nails, Bolts or Mitering of Legs!

Sizes for 1x4's and 2x4's

Simply put lumber in jaws and leg sockets—and tighten wingnut! The members are locked rigidly in place—can't slip or work loose. Use for barricades, scaffolding, platforms, etc. Disassemble on the job. Made of heavy gauge steel, rust resisting finish. At Hardware, Bldg. Supply stores, or write—

DALTON MFG. CO., 20 S. Central, St. Louis 5, Mo.

For low priced, quality bracket, ask for new Spee-Dee Sawhorse Brackets.



Two Independent Pumps Share Common Housing

Two double pumps for mobile applications requiring two independent hydraulic power sources are announced by Vickers, Inc., 1492 Oakman Blvd., Detroit 32, Mich. The units consist of two vane-type pumps in a single housing, driven by a common shaft. The manufacturer recommends the double pumps for material-handling equipment and for road and construction machinery.

Ten sizes of series V-2200 pumps are available, with any combination of 2, 5, 8, or 11-gpm delivery units. Series V-3200 pumps are made in 16 sizes, with a choice of a 2, 5, 8, or 11-gpm at the small end, and a 12, 15, 18, or 24-gpm at the other. A choice of splined, threaded, or straight-keyed shafts and face, flange, or foot mountings is available.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 99.

Soil-Conservation Book

A technical publication on erosion-control problems has been issued by the Navy Bureau of Yards and Docks, under the title "Soil Conservation" (NAVDOCKS TP-Pw-5).

The book, which is the first of its kind to be put out by the Navy, is designed to help Navy Civil Engineer Corps officers and civilian personnel in the design and construction of modern naval facilities. It sets out techniques and practices applicable also to engineering projects of private enterprise, and includes tables and illustrations. Copies are available on a loan basis at The Bureau of Yards and Docks, Room 2B79, Yards and Docks Annex, Washington 25, D. C.

Large Jaw Crusher

A 42 x 48-inch overhead eccentric jaw crusher is announced by the Pioneer Engineering Works, Inc., 1515 Central Ave., S. E., Minneapolis 13, Minn.

A feature of the crusher is that the roller bearings can be removed from the shaft hydraulically. Since the shaft is provided with grooves, the oil under pressure expands the inner races enough for the bearings to be slid off.

The manganese jaws are of 2-piece construction to facilitate handling and are said to be designed to reduce wedging resulting from cold flow and peening of the metal. The base is a double-wall unit built in an upper and lower half so that it can be lifted and lowered with standard equipment.

Adjustments permit an opening at the bottom of the jaws from 4 to 13 inches. Length of the moving jaw is 104 inches and that of the stationary jaw, 90 inches.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 106.

This picture gives an idea of the size of Pioneer's latest and largest addition to its line of jaw crushers.

Good lubricants at regular intervals are good for your equipment.

SASGEN
New Electric-Powered CHAMPION DERRICK

Boom only can be supplied for use with old-style Mast and bottom

Single line cap. 300# @ 100 feet per minute

Double line cap. 600# @ 50 feet per minute

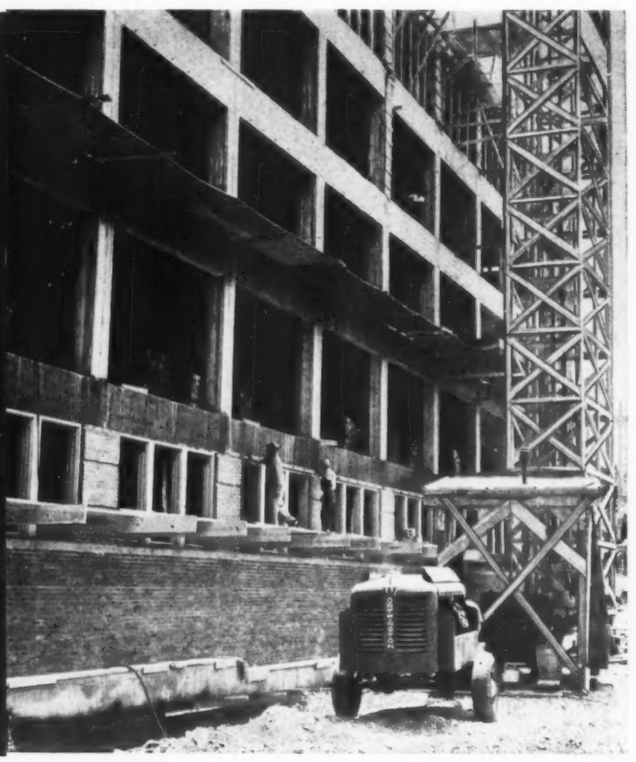
The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.

SASGEN DERRICK COMPANY
3131 W. Grand Avenue, Chicago 22, Illinois

"We can depend on our BLUE BRUTES"...

Writes J. E. Dunn, Jr., of the J. E Dunn Construction Company, Kansas City, Mo., about Worthington construction equipment.



WORTHINGTON BLUE BRUTE 105-ft. compressor used by the J. E. Dunn Construction Company in construction of a new addition to the University of Kansas Hospital.

HARD-HITTING BLUE BRUTE breaker at work on the hospital job.

Mr. Dunn goes on to say: "We find that we can depend on our Worthington 105-foot and 60-foot compressors, which we have been using now for approximately 6 years. Maintenance costs of these units have been extremely low.

"We have used the Worthington Blue Brute to power hand-held air tools and kindred equipment on all types of construction jobs. Many of our jobs have been extremely tough, but our superintendents have learned to expect uninterrupted service from these machines and to date they have been getting just that. We believe in using the best machinery we can buy, because we know from our past experience that we get more for our money by buying the best."

Find out how Blue Brutes can step up efficiency on your construction jobs. Contact your nearest Worthington district office or distributor for more facts and bulletins. Or write to Worthington Corporation, Construction Equipment Division, Plainfield, N. J.

H.3.2

If It's A Construction Job, It's A BLUE BRUTE Job

WORTHINGTON
Construction Equipment

Oscar Hasbrouck Honored

At a recent farewell luncheon in Albany, N. Y., officials of the New York State Department of Public Works paid tribute to Oscar Hasbrouck, who has retired as Assistant Superintendent in Charge of Operation and Maintenance of Highways, Thruways, and Bridges.

Mr. Hasbrouck looks back on a long engineering career. He entered the state service in 1905, interrupting it only during World War I when he served as Captain in the Corps of Engineers, U. S. Army. Mr. Hasbrouck, who resides in Troy, will continue his activities as a consultant on engineering problems.

Lester H. Krick of Utica, formerly Associate Engineer in charge of Operation of Canals and Waterways in District No. 2, is Mr. Hasbrouck's successor in the Department of Public Works post.

An electric chain pulley and a trolley mounted on a monorail substitute for material tower and A-frames in handling 300 to 500-pound limestone blocks.

Electric Chain Pulley Places Limestone Blocks

Several problems were obvious to contractor J. M. Odom, when he began to build St. Austin's Church and Rectory at Austin, Texas, in July, 1952. The job was obtained on such a close margin that no loss of time could be permitted. Plans called for inside and outside walls of blocks of Leander limestone weighing from 300 to 500 pounds each, although the structural-steel frames had no permanent floors from which the blocks could be handled. The walls, too, were high, ranging from 35 to 40 feet.

Since the foundation was to rest on solid rock, real problems arose when the rock turned out to be 20 feet deeper than originally anticipated. As excavation toward the rock continued, water seepage increased, requiring constant pumping. Because of the foundation trouble, an extension of the time element in the contract was secured.

But a heavy financial loss still seemed inevitable in view of the time that must be consumed in using conventional methods of material tower and A-frames to lift and set the blocks, so the contractor had to reject these orginal plans.

Odom contrived a new approach by using an electric chain pulley and a trolley mounted on a monorail which ran the length of each of the high walls. The blocks came from the quarry with Lewis pin holes in the upper edges. They were lifted by attaching a chain sling with two Lewis pins and setting the pulley into operation. Meanwhile, the monorail allowed the pulley to be accurately positioned at all times.

The new technique permitted greater speed of operation because the lifting and setting of the blocks were accomplished in one operation instead of the conventional two, and greater control was gained in positioning the stone because the pulley line was plumb at all times.

A ¾-hp single phase 110-volt electric chain pulley and ball-bearing trolley mounting was used. The pulleys had chain pans and canvas covers. Odom estimated that savings resulting from the new technique would total approximately 30 per cent.

Buy U. S. Defense Bonds

Worthington Rotary Blitzer in action on expressway shoulder. High-speed rotary cutting units slice through anything from grass to tall weeds.

new WORTHINGTON ROTARY BLITZER

DOUBLES MOWING VOLUME

The new Worthington 3-gang Rotary Mower means *extra power* for faster, better mowing. Each of the big, rugged Worthington cutting units is independently powered by a heavy-duty 13.3 hp. Wisconsin engine. This means adequate cutting power at all times regardless of density of growth. Towing vehicle can travel at the most desirable speed consistent with density of growth and ground contour.

Speeds Mowing of Shoulders, Center Sections

With its 17-ft. swath, the Worthington Rotary Blitzer cuts 10 acres per hour at a mowing speed of 5 mph. —80 acres per eight-hour day. Power take-off mowers operating at the same speed cut only 40 percent of this volume — sickle bars only 20 percent!

Name Your Hauling Unit

Jeep, truck, small tractor—any one can pull the Rotary Blitzer. No power take-off to restrict type of vehicle, turning radius, cutting speed, etc.

Get the full details on this fast-cutting, cost-cutting mower. Send the coupon now.

WORTHINGTON MOWER COMPANY
STROUDSBURG, PENNSYLVANIA

WORTHINGTON MOWER COMPANY
Stroudsburg, Pennsylvania

Gentlemen: Please send full details about your Rotary Blitzer.

Name.....

Title.....

Street or Box No.....

City.....

State.....

"ON-TIME" Maintenance *cuts* "DOWN-TIME" REPAIRS!

HOBBS *Engine Hour* METERS

Remove Maintenance Guesswork

You get longer life and longer periods of trouble-free operation when you know the length of TIME your powered equipment has run. A revolution counter can't tell you — it takes a true timing instrument that records HOURS and MINUTES. The HOBBS ENGINE HOUR METER is such an instrument . . . it helps prevent breakdowns and prolong equipment life.

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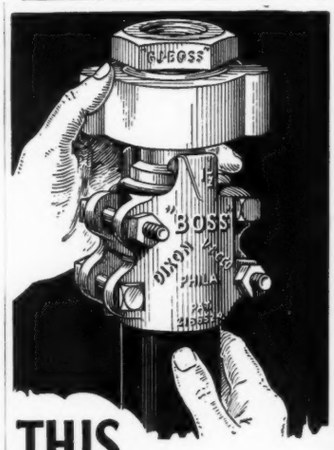

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has no equal for efficiency, durability and safety in every high or low pressure hose service . . . steam, water, gas, air, oil, hydraulic. Ground joint union between stem and spud provides leakproof, trouble-free seal. Furnished with super-strong, "Boss" Offset and Interlocking Clamp.

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GROUND JOINT FEMALE COUPLING
STYLE X-34

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DIXON VALVE & COUPLING CO., LTD., TORONTO, Associate Companies:
Buck Iron Company, Inc., Quarryville, Pa. · Precision Drawn Steel Company, Sterling, Ill.

The Tracto-Lift snow-plow attachment is available in two models—the stationary V-type and the adjustable angle-type.

Snow-Plow Attachment For Fork-Lift Trucks

A new snow-plow attachment for their heavy-duty fork-lift trucks is announced by Tracto-Lift Co., 800 E. 18th St., Kansas City, Mo. It is available in two models, a V-type and an angle-type. The V-type remains stationary, throwing the snow away to both sides with a swath 60 inches wide. The angle type, 84 inches long, is adjustable to a wide variety of angles, making it possible to pile the snow on one or both sides as required.

For further information write to the company, or use the Request Card at page 18. Circle No. 100.

Tarpaulins on Frames Enclose Open Trucks

A folder on truck tarpaulins is available from the C. K. Turk Corp., 1122 Mishawaka Ave., South Bend 15, Ind. Caravan Top Tarpaulins shown include the Personnel Carrier model for pickups. It has a 4 or 5-foot clearance, one window facing the cab, two windows on each side for interior lighting, and a back curtain with slide fasteners on both sides. The cover fits over an aluminum frame.

Another top converts a stake-body truck to a panel-type carrier. Five longitudinal slats fit on top of the stake slots to support the tarpaulin. A fitted cargo cover is also made for stake trucks. The tarpaulins are available for stake trucks with 9 to 12-foot bodies.

The folder also shows a folding-tailgate step for pickups and a slatted front-end gate that protects the truck cab and windows from a shifting load.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 73.

Preload Promotes Tripp

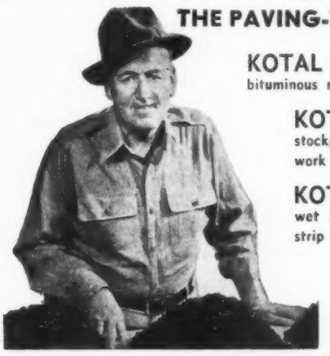
Andrew E. Tripp is the new Assistant Sales Manager of Preload Construction Corp., New York, N. Y. With the contracting firm since 1948, Mr. Tripp in his new position will supervise and coordinate the work of Preload district representatives throughout the country in securing contracts for the construction of prestressed tanks, pipelines, bridges, buildings, and other structures.

Structural Steel Bolting

Bolts for structural-steel connections are covered in a booklet from Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. The booklet tells the advantages of bolting as compared to riveting. It also gives examples of bolted construction under static loading, vibratory impact, and reversal of stress loading.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 10.

THE PAVING-WISE ROAD MAN KNOWS—



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KOTAL PROCESS water and weatherproof stockpile-mixes can be used for road maintenance work all year 'round.

KOTAL PROCESS is excellent for coating wet aggregate and producing mixes that will not strip even under severest conditions.

Write for up-to-date laboratory findings.

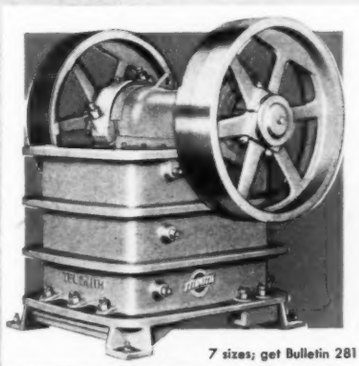
KOTAL COMPANY

360 Springfield Ave. Summit N. J.

2,500,000 TONS Crushed--

"have yet to replace any essential or expensive parts"

SAYS GEN. MGR. OF ROCKYDALE QUARRIES CORP., ROANOKE, VA.



7 sizes; get Bulletin 281

We have a 25x36 Telsmith Jaw Crusher which we installed in 1945. From that time to this we have put through that crusher almost two and a half million tons of dolomitic limestone and have yet to replace any essential or expensive parts. The cost has been an extreme minimum and..we are happy to recommend this crusher to anyone with similar problems.

ROCKYDALE QUARRIES CORPORATION

Gordon C. Willis

Gordon C. Willis, General Manager

C-9

TELSMITH Jaw Crushers

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Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Interstate Equipment Co., Statesville, N. C.

Structural Plates For Bridge Floors

New Type of Corrugated Steel Base Is Covered with Bituminous Concrete in Replacing Old Wooden Decks

By C. ROBERT CLAUER, Chief Engineer
United Steel Fabricators, Inc., Wooster, Ohio

Anchoring the plate to the stringers by means of scattered welds.

• ONE of the new developments in bridge flooring is structural plate, a bridge flooring which consists of corrugated-steel plates field-welded to bridge stringers to provide a continuous steel base over which bituminous concrete surfacing is applied.

Looking back through the pages of bridge-flooring history we find a general similarity between this new structural plate floor and the old Belmont floor. The corrugated outline of the latter, it will be recalled, was formed by laying lightweight structural channels side by side with their webs horizontal and flanges of adjacent channels extending alternately up and down. The flanges were riveted together and alternate channels riveted to the stringers. The troughs of the corrugations were filled with asphalt plank and then asphalt plank or other bituminous surfacing was applied over the whole bridge floor.

A Typical Bridge

Suppose we look at a typical steel-truss-type highway bridge. From the sides the structure appears to be in good condition. Let us examine the end of the bridge. In general the structure appears all right, but what about the reduced-load sign?

Now we go up and look at the floor of the bridge. The floor is rough, and weak in places—it vibrates and rattles when we drive over it. What about the condition of the floor system supporting this wood deck? If we could remove the wood deck we would find the floor system badly in need of repair. The top flange of the outside stringers is nearly rusted away. This bridge needs help.

Corrugated Steel Plates

Today there are thousands of steel highway bridges with old wood floors that need replacement. This problem requires more economy than is possible with the old Belmont floor. A structural-plate bridge flooring was developed to meet this need, utilizing modern materials and mass-production technique. The design was also aimed at keeping erection and maintenance labor to a minimum. It is not new but it's a new model.

It consists of corrugated steel plates 2 feet wide, 2 inches deep, and long enough to extend across the full width of the bridge roadway. The corrugations are 2 inches deep on a 2-inch pitch. Oval holes are provided in every corrugation at every stringer for welding purposes, and at the quarter point between stringer centers for weeping purposes. The plates are regularly made from mild steel in accordance with ASTM Commercial Grade Specifications A-245. Each plate is thoroughly degreased and given one shop coat of baked-on phenolic-resin primer immediately after fabrication. This modern high-type paint, which converts to a hard dry coating at high temperatures, is adaptable to mass-production operations. It provides better protection to the plates during storage, shipment, and erection and affords an excellent base for field painting.

Dams are welded to the ends of plates to retain surfacing material at roadway edges. They extend below the plates to provide a dripping edge for surface water. The plates have a uniform symmetrical corrugation and rest directly on the bridge stringers. The offset side provides a continuous uniform base for the wearing surface and permits slight adjustment during erection.

Plates are welded to each stringer with two fillet welds at every corrugation and every stringer. Adjacent plates are joined at the edges by lapping and are welded together with a bead weld 3 inches long, midway between stringers. When necessary to maintain traffic during erection, the floor may be erected one-half at a time. Then, all plates are spliced over a center stringer. These splices are field-welded, using a continuous butt weld across the top side of the plates.

The bituminous concrete surfacing is usually applied to the flooring in

"Tag Master"
"Tops" in Bucket Control

As your clamshell "flies through the air with the greatest of EASE," watch the eyes of the "sidewalk superintendents" POP!

You, too, will be delighted with the EASE with which you *cast* the clamshell, or *snub* it, or *twist* it, getting into hard-to-reach corners and picking up hard-to-manage rocks.

You'll find the tagline pull *uniform* at all bucket levels and *adjustable* to fit any job.

In addition you can use your TAG-MASTER as a *dipper-trip!*

Some of these advantages YOU NEVER HAD BEFORE . . . unless you have already used a TAG-MASTER!

For more details about this combination tagline winder and dipper trip, mail the coupon below.

MORIN MFG. CO., INC.
WEST SPRINGFIELD, MASS.

Please send "Tag Master" details.

Make of our machine .....
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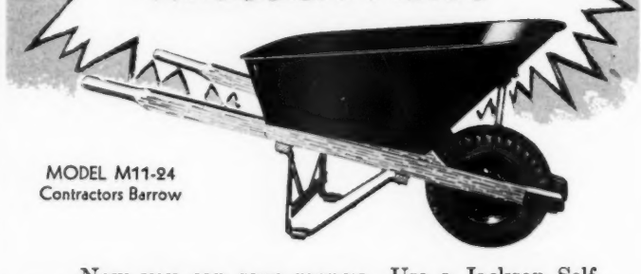
JACKSON ANNOUNCES NEW SELF-LUBRICATING WHEELBARROWS



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FLEXCO FASTENERS
with ASSEMBLED BOTTOM PLATES
For the large quantity user

ASSEMBLED BOTTOM PLATE

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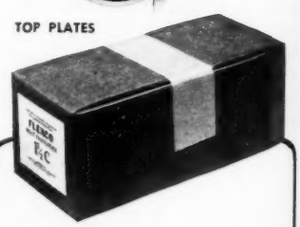


You can now save assembling time at *no increase in price!*

FLEXCO Conveyor Belt Fasteners with assembled bottom plates, are available in "C" cartons of 100 complete sets each.

Parts are kept separate in the carton.

Made of Steel, Stainless, Monel, Everdur and Promal — order them in "C" cartons.

See Your Supply House

Bulletin F-106 Gives Complete Details

FLEXIBLE STEEL LACING CO.
4608 Lexington Street
Chicago 44, Illinois

two increments. First a base course to fill the corrugations, then a 2-inch wearing course above the corrugations. After each course is applied, the surface is rolled for compaction.

When structural-plate bridge flooring is welded to the bridge stringers and covered with bituminous concrete it is capable of supporting H-15 and H-20 highway loading for various stringer spacings, depending on the gage of metal flooring used. The floor, including the surfacing, weighs approximately 35 to 40 pounds per square foot.

A Replacement Project

To see how structural-plate bridge flooring is helping to reduce the ever-increasing number of bridges with these reduced-load signs, let us follow through a typical bridge-floor replacement project. First of all, the bituminous surfacing, if any, should be removed from the deck. Then, beginning at one end of the bridge, the worn plank is removed in convenient working sections. A winch truck having an A-frame derrick is frequently used to remove the wood floor.

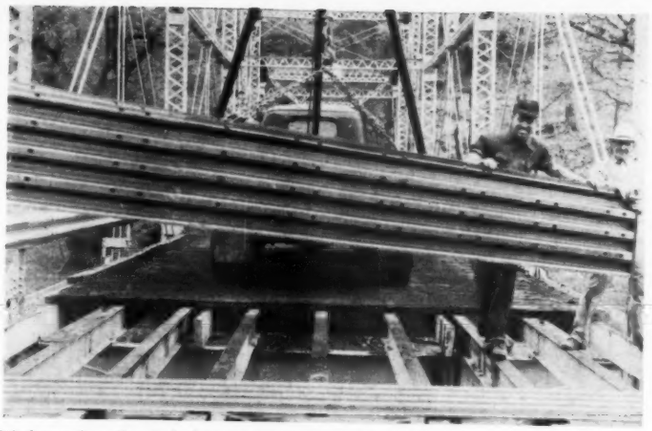
After the old floor is removed, necessary repairs or replacements and painting of stringers and floor beams should be made. It is important that any low stringers be raised to provide uniform bearing for the new steel floor plates. The winch truck then brings several bridge-flooring plates from the stockpile and deposits them on the stringers. Workmen place the plates in proper position for welding.

All welding should be done by competent experienced welders. After the first plate is correctly positioned, it is anchored to the stringers by placing a few welds at scattered locations. Subsequently plates are given the same treatment. In some cases it is necessary to apply slight pressure to the plates to insure proper contact with the stringers. After the flooring is "anchored" it is ready for complete welding. This consists of placing a ⅛ x 1-inch fillet weld on both sides of the welding holes located in the valley of each corrugation at each stringer. The second and succeeding plates are welded together by 2-inch bead welds on the overlapping joint midway between each pair of stringers. Then all welds are cleaned and painted.

The bridge with the structural-plate flooring completely welded in place is now ready to receive the surfacing material. Check to see that all plates are welded to the stringers and to each other. Be sure plates are clean, dry, and free of erection debris. Then apply a bituminous prime coat of the type common to your locality to the top side of the plates. If the underside of the floor has not already received two coats of field paint, now is a good time to do it.

Bituminous Paving

The paver then applies the first course of bituminous material. Either hot-mix asphaltic concrete or cold-mix material may be used. The first course should be applied to the floor to a level slightly above the top of the corrugated crests and then rolled thoroughly. A second course of similar or finer material is next placed over the first course, so that



Workmen place the steel plates in proper position for welding.

when finally rolled the resultant surface will be at least 2 inches in thickness above the corrugations at the roadway center. This may taper off to 1 inch in thickness at the roadway edges to provide a crown. If cold-mix is used, a bituminous seal coat should be applied over the surface to complete the job.

After the bituminous pavement is placed and rolled the bridge is ready to be returned to service. Years of reduced maintenance and rattleproof service lie ahead. The whole operation can be done with speed and efficiency with the result that out-of-town service time is reduced to a minimum. Many seriously weakened structures have been returned to full capacity as a result of minor repairs to the floor system, the installation of a structural-plate bridge floor, and the laying of a bituminous wearing surface.

During the past 3 years approximately 300 bridges have been reconstructed using structural-plate bridge flooring.

Some Questions and Answers

Now for the questions most frequently asked.

1. Q. Does this flooring stiffen the structure?

(*Concluded on next page*)

B.F.Goodrich

New Earth-Mover tires haul giant loads, yet float over sandy ground

FRANK T. HICKEY, INC., of Los Angeles is an earth-moving firm operating throughout southern California. The unit above is hauling 24 tons of sand fill for troop barracks at Fort Ord.

Plowing through sandy soil under a 24-ton payload, plus the weight of the equipment, would cause most tires to bog down and become useless. That's why this contractor mounts his machinery on new B. F. Goodrich All-Nylon 65" Special Earth-Mover tires. They are specifically designed to pull through loose, shifting soils without sinking in.

Special Earth-Mover tires do this because they operate at low air pressures that give greater flexibility. The tires conform more to the soil, rolling over it rather than digging into it. The cord body of the tire is made of nylon which stands the strain of this flexing action better than other materials.

Because extra-high cleats often have a tendency to churn the ground, Special Earth-Mover cleats are low and shallow. They provide positive traction, yet will not dig in and cause the tire to flounder. Your equipment stays on top of the earth and on schedule.

If your off-the-road job calls for work in soft, sandy ground, you can get top traction and flotation by using new B. F. Goodrich All-Nylon Special Earth-Mover tires. They are the result of two years' development and testing by a noted off-the-road equipment manufacturer.

B. F. Goodrich makes a complete line of tires that cut costs and save time on all types of off-the-road service. See your retailer—he's listed under Tires in the Yellow Pages of your phone book—or write *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Specify B. F. Goodrich tires when ordering new equipment

Structural Plates For Bridge Floors

(Continued from preceding page)

A. Yes. When the bridge flooring is welded to the top chords of the stringers they are afforded complete lateral support and are therefore able to resist lateral buckling to a maximum degree. The bridge flooring also forms a horizontal steel diaphragm which has a tremendous effect in stiffening the structure laterally. This assists materially in dampening the whip action prevalent in some steel-truss-type bridges.

2. Q. Are special welders required for this work?

A. No, only the simplest type of down hand-welding technique is required. However, welders should be experienced and qualified for structural welding work. The floor must be welded to the stringers and is not merely tacked.

3. Q. Can the corrugations be laid parallel to the traffic (stringers perpendicular to traffic)?

A. Experience on a few structures on which the floor has been installed in this manner indicates no difference in performance. None was expected, and the answer is yes.

4. Q. Can you use either hot-mix or cold-mix surfacing material?

A. Yes, either hot-mix or cold-mix can be used on structural bridge flooring. A tack coat should be placed on the flooring before the application of the mix in each case. In this case of cold-mix, a seal coat should be applied soon after installation. No special mix is required and in most states the same mix that is used on the road is used on the bridge. A dense mix helps to prevent the penetration of surface water and its use is recommended for that reason.

5. Q. Will the bituminous surface corrugate?

A. The answer to this question amazes most engineers and road builders. Our experience has been that the bituminous surface will not corrugate. To some this is remarkable, due to the difference in thickness of the bituminous surfacing over the crests and valleys of the corrugations.

This is what happens in practice. After the bituminous surfacing is applied to the bridge flooring and given its final roll, the roadway surface, if observed at the correct angle, appears to consist of a series of horizontal or transverse stripes alternating light and dark. This striped effect coincides with the peaks and valleys of the corrugations below and appears to indicate that the surface is corrugated. Actually, if the surface is checked with a straightedge it is found to be smooth. What then produces these transverse stripes? When the surface is rolled, the material directly over the crests of the corrugations is compressed more than the material over the valleys of the corrugations, and consequently the bituminous material in these areas has greater density than the material over the adjacent valleys. Materials of different densities have different light reflectivities. When light is reflected from the surface of the bridge deck, the alternating surface densities produce an alternate light reflectivity and the striped effect. It's purely this reflection of light that causes the appearance of corrugations. In service there is no marked degree of change.

6. Q. Will the bituminous surface crack and free itself from the steel floor?

A. Our experience has been that the bituminous surfacing adheres to the corrugated floor extremely well. If your floor system is uniformly well supported and you get a good welding job on your bridge flooring, the bituminous surfacing will hold. On a bridge with very light stringers you will usually find a small transverse crack in the surfacing occurring over each floor beam. This condition is recognized as being due to the deflection in the stringers and not dependent on the bridge flooring.

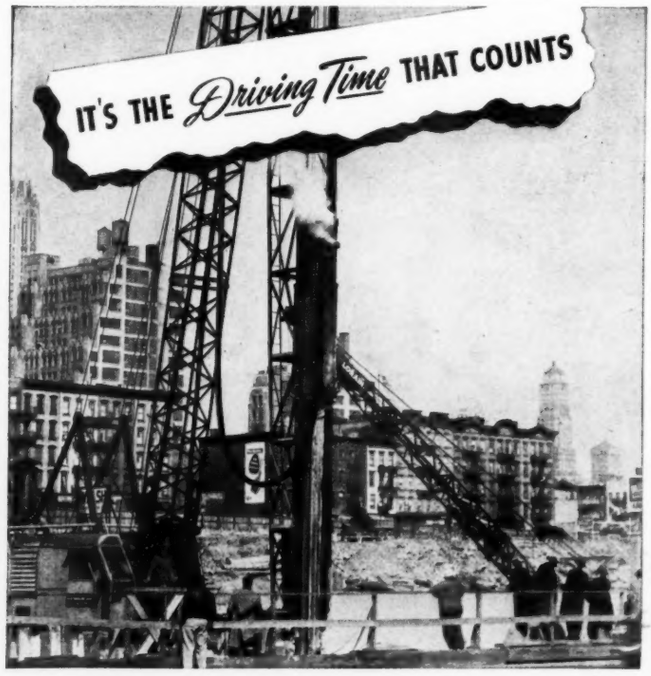
7. Q. What about corrosion?

A. A number of structures that have been floored for several years have been checked. Where a dense hot-mix surfacing was used and the plates were given two coats of field paint, there is no evidence of corrosion.

From a paper presented at the 1953 Annual Meeting of the American Road Builders' Association in Boston, Mass. Its author, C. Robert Clauer, is Chief Engineer of United Steel Fabricators, Inc., Wooster, Ohio.

Southwest Institute Has a New Laboratory

The withdrawal of the John B. Pierce Foundation from the field of applied and developmental research and its decision to concentrate activities solely to fundamental research at its New Haven, Conn., laboratories, has made possible the transfer of its skilled and experienced architectural and engineering staff as a group to the Southwest Research Institute, San Antonio, Texas. As a result, the Southwest Research Institute, a nonprofit scientific organization, is establishing building research laboratories at 240 Nassau St., Princeton, N. J. The laboratory offers industrial and governmental sponsors a complete building research facility in design, engineering, materials, and equipment, as well as in the techno-economic aspects of the construction industry.



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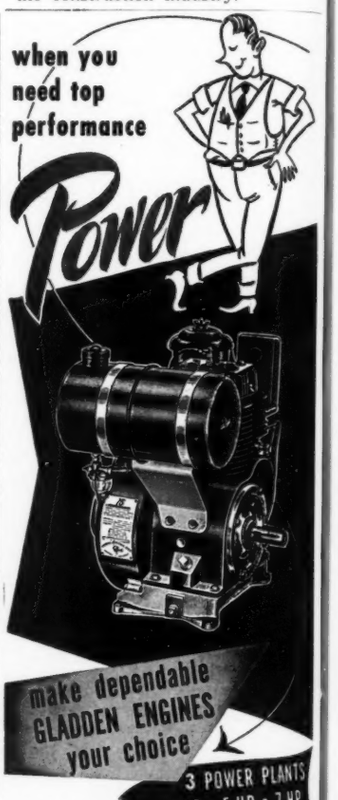

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New Front-End Shovel On Crawler Tractor

A new track-type front-end shovel of 2-yard capacity, the No. 6, is announced by the Caterpillar Tractor Co., Peoria 8, Ill.

The No. 6 is powered by a 66-drawbar-hp crawler tractor. It is an integral unit with the shovel frame bolted and welded at widely separated points on the tractor-engine support channels and the transmission housing. The dumping height is 10 feet 9 inches with a reach of 3 feet 5 inches. The manufacturer stresses that in both the raised-carry and raised-dump positions, the operator has unobstructed visibility both front and rear.

The lift cylinders are horizontally mounted above the tracks to avoid the possibility of clogging with dirt, and side-door panels prevent dirt from getting to the engine. There is a bumper guard in addition to the customary radiator guard. A heavy cross-section brace between the lift arms maintains bucket stability.

To keep operator fatigue at a minimum, the control levers for the bucket and the lift arms are located so that both may be operated with one hand. The hydraulic lift-arm control lever, once engaged, remains in position without holding. The operator has both hands free to shift gears or turn the shovel, while the bucket continues lifting. At the maximum lift, an automatic kickout disengages the lever.

The unit has five gears forward and four in reverse. Large front idlers add stability and permit more accurate control of the machine. It has longer track-roller frames than the D6 tractor and one track roller has been added to each side for increased traction and lateral stability. The 18-inch flat-center shoes were designed specifically for tractor-shovel work and combine the characteristics of flotation, traction, and resistance to sideslip. A solid bar is used in place of an equalizer spring for greater cross stability and to prevent track oscillation.

For further information write to the company, or use the Request Card at page 18. Circle No. 65.

How to Combat Corrosion

A new booklet on coal-tar protective coatings has been released by the Tapecoat Co., 1523 Lyons St., Evanston, Ill.

It presents practical suggestions for combating corrosion. Details tell how and where coal-tar protection can be used to best advantage and case histories show how corrosion problems have been overcome.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 157.

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A few exclusive dealer territories are available.

FRANK D. MESSENGER
Messenger Vibrators

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FAIR HAVEN, MICH.

Caterpillar's new front-end shovel, the No. 6.

Soil-Compaction Method

A method of compacting granular soil and sand is described in a booklet from the Rust Engineering Co., Rust Bldg., 575 Sixth Ave., Pittsburgh, Pa. The Vibroflotation method produces cylindrical compacted sand columns in the ground. The columns are from 8 to 10 feet in diameter. Spaced in overlapping patterns, they make a sand subsoil of a specified minimum of density.

The booklet shows the vibrator about to enter water-saturated sand. In the ground the Vibroflot moves laterally ¾ inch. A recording ammeter is used to tell the operator when full compaction is attained, since this is determined by the power input of the electric vibrating motor.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 67.

Fast reverse speeds eliminate turns— TIMKEN® bearings add dependability

BECAUSE the Koehring Dumptor travels as fast in reverse as it does forward, it eliminates turns on shuttle hauls, saves as much as ½ minute every round trip. To keep it on the job, day after day, with minimum time-out for maintenance and lubrication, Koehring mounts the directional transmission reduction shafts and drive axles on Timken® tapered roller bearings.

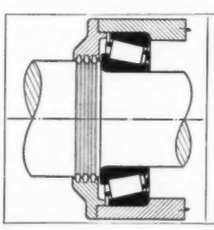
Line contact between the rollers and races of Timken bearings provides extra load-carrying capacity. Due to their tapered construction, Timken bearings take both radial and thrust loads in any combination. Shafts are held in proper alignment, gears mesh with accuracy, wear is reduced.

Closures are more effective because Timken bearings keep housings and shafts concentric. Lubricant is kept in—dirt, mud and water are kept out. And friction is practically eliminated due to the incredibly smooth surface finish and true rolling motion of Timken bearings.

No other bearing gives you *all* the advantages you get with Timken tapered roller bearings. Make sure you have them in all the equipment you build or buy. Always look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How THE KOEHRING COMPANY mounts the drive axles of its Dumptor on Timken tapered roller bearings.



LUBRICANT STAYS IN —DIRT KEPT OUT

Because Timken bearings hold shafts concentric with housings, closures are made more effective. Lubricant is retained, dirt and moisture kept out.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

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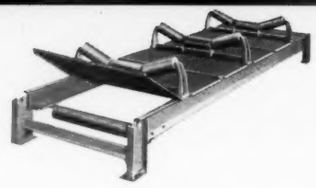
TAPERED ROLLER BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

Sectional Conveyor

A sectional conveyor in channel-type construction is offered by Transall, Inc., P. O. Box 1588, 153 N. 11th St., Birmingham, Ala. Sections come in 12-foot lengths and idlers are spaced to meet operating requirements. Rolls are 4 or 5 inches in diameter.

Channel side members can be furnished in either demountable construction or bolted for permanent installations. The side members are mounted on the supporting chairs with a hinged connection



which allows the conveyor to conform to uneven or rolling terrain. The supporting chairs have slotted foot pads for spiking to wooden cross ties.

Special sections can be furnished to allow for expansion and contraction on installations which will be subjected to wide temperature changes.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 110.

Power Cranes and Shovels

A series of eight articles on the use and application of power cranes and shovels has been compiled under one cover by the Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.

The 32-page booklet contains a detailed discussion of the basic principles of power shovel and crane operation. Photographs, drawings, graphs, and tables help explain the capabilities of various excavator and crane attachments. Making a proper selection of this equipment for ordinary operating situations is also discussed.

Two articles are devoted to safety considerations with excavators and excavator-operating costs.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 120.

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CASE HISTORY No. 528-84

USER: B.L. Anderson,
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INSTALLATION: 21 GM Diesels (3, 4, and 6-71's and "Twin" 6-71's) powering shovels, Koehring Dumptors and three portable rock crushers. Firm produces 4,000 to 5,000 tons of road stone per day.

PERFORMANCE: Supt. L.V. Porter reports GM Diesels have reduced fuel and maintenance costs considerably. Overhauls cost less and are needed less frequently. Crushers can run 7" material without stalling engines. Lighter weight of engines has made equipment easier to move.

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CUT CRUSHING COSTS with GM DIESEL POWER

When this company replaced the gasoline engine in a shovel with a General Motors Diesel in 1945, fuel costs dropped 50%. That was B. L. Anderson's first GM Diesel. Now they own 21 units, because they found these engines reduce operating expenses.

The GM Diesel boosts production in all kinds of heavy-duty jobs because smooth 2-cycle operation makes it accelerate faster under load changes. It starts quickly in any weather and operates on a miserly quantity of low-cost fuel. It delivers dependable, economical power for thousands of hours without requiring major repairs.

And when service is needed, you'll find the cost surprisingly low. Compare parts costs with other Diesels, for example, and you'll quickly see what we mean. That's one of the many good reasons why contractors in every field are switching to GM Diesel power.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

New 2½-Ton Truck

A new 2½-ton GMC truck has a 270-cubic-inch 130-hp engine, whose horsepower rating and compression ratio has been increased over that of an earlier version used in World War II trucks.

The truck, Model 400-27, is rated at 18,000 pounds gvw and 30,000 pounds gcw. It is available in wheelbases ranging from 137 to 197 inches. Body types are made in 9 and 12-foot platforms or stakes. The front axle is rated at 4,500 pounds capacity while the rear-axle capacity is 15,000 pounds.

For further information write to the GMC Truck & Coach Division of General Motors Corp., 660 S. Boulevard, East, Pontiac 11, Mich., or use the Request Card at page 18. Circle No. 92.

Tire and Rim Mounter

A new pneumatic tire and rim-mounting machine has been designed by the Autocar Co., Ardmore, Pa. One man can mount a large tire with the rig. According to the company there is no risk of damage to the tire or rim.

A stepped-down circular casting which can hold wheels or demountable rims 20, 22, or 24 inches in diameter is set over an 18-inch pit, 24 inches in diameter. The bottom of this casting is at floor level. Fastened on a plate in the pit below the floor level is a pair of Westinghouse air-brake cylinders, each 6 inches in diameter, with a 2¾-inch stroke and a capacity of 1,500 to 2,000 pounds per square inch. Both brake cylinder arms are fastened to an 11-inch crosspiece of ½-inch steel. A 2-inch steel spindle rod attached to the center of this crosspiece rises through the center of the stepped-down casting to about 5 inches above the floor. A ⅝-inch cross-rod is mounted through the top of this spindle.

In mounting a tire, the operator first places a rim base on the stepped-down casting. Next, he drops the tire on the rim base, slips the side ring on afterwards, and positions the locking ring. He then lowers a three-armed spider, hooks it on to the spindle rod which comes up through the center from the pit, and locks the two with a quarter turn. The three spider arms notch on to the side ring and, as the operator turns on the compressed air, force it and the bead of the tire down past the locking-ring seat on the rim. With a sharp tap of a hammer, the operator seats the locking ring. The spider is then released. The Auto Car Co. will supply plans for the device free to the industry.

For further information write to the company, or use the Request Card at page 18. Circle No. 47.

Ferriol for Warco

W. A. Riddell Corp., Bucyrus, Ohio, has appointed Stephen L. Ferriol new Sales Representative in the northeastern states. He will make his headquarters in Westfield, N. J., where he will direct sales and service operations of Warco Hercules road rollers and motor graders which include the 85-hp Model 4D-85 and the 100-hp Model 4D-100.

Truck Model 400-27 is powered by a modern version of the engine used on military vehicles of this size in World War II. GMC is the manufacturer.

Machine-Gun Blast Photos

A new independent company has been established to take machine-gun sequence blasting photos at quarry, stripping, and construction operations. It will be known as Sequence Photo Service, located at 705 Tatnall Street, Wilmington 1, Del., with branch offices in Chicago, Ill., St. Louis, Mo., and Boston, Mass., to expedite assignments.

The company, equipped with the latest-style machine-gun sequence cameras, makes contracts for blast photos with operating companies, seismograph organizations, consulting engineers, and explosive suppliers. Camera operators are experienced in blasting work.

Photos have been found helpful in analyzing reasons for escaping gases, noise, types of breakage, and the effectiveness of various millisecond-delay patterns. Three photos a second are taken on a 5-inch negative so that enlargements of the different stages of the blast are clear and sharp. There are 10 to 12 photos in each blast sequence. Rates are $50 for the first blast and $10 for each additional on the same day.

Further details of this service may be obtained by writing to the company.

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CLECO AIR-OPERATED RC-50 and RC-80 PAVING BREAKERS

The Reed-Cleco Valve, found only in Cleco Paving Breakers, gives full control of both power and return strokes, reducing recoil.

Cleco Paving Breakers hit hard and fast. They produce more work per man per hour and cost less to maintain than any other demolition tools in their class.

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Flood-Control Job Started by County

Storage Reservoir, Levee, Spillway, Outlet Works And Training Channels to Protect Arizona City

• IN southeastern Tucson, where an expanding city is spreading over the low ground of a natural watercourse, Arizona's Pima County has come to the rescue of its people with a comprehensive flood-control plan. Pioneer Constructors, a Tucson contracting firm, has the first $350,000 worth of work under a contract with Pima County Flood Control District. Pioneer's contract calls for construction of a 7,000-foot curved dike, inlet and outlet channels, and appurtenant works.

Future channels, which will be dug under a later contract, will insure flood protection for the entire southeastern quarter of the city. Tucson is situated on a plain at the foot of lofty mountains, and is vulnerable whenever flash rains fall on the mountain slopes and high plains north of the city.

160-Acre Lake

The reservoir area enclosed at high water by the new dike will cover the biggest part of 160 acres of land just east of the Tucson Downtown Airport. The earthen levee makes four alignment changes to encircle the reservoir area. It is 23 feet high at its tallest point, has a 20-foot crest, 3 to 1 side slopes, and contains 491,330 cubic yards of compacted earth fill.

High-speed spreading of earth for a Tucson flood-control dike is done by this Adams 610 motor grader. *Ray Day Photo*

Leading into the head of the reservoir area is South Interceptor Canal, a 4,000-foot ditch carved in the desert floor from drainage areas higher up. A 3,000-foot outlet canal with gate structure and controllable gates will carry reservoir water down to a wash near South Tucson, leading off to lower ground. A large spillway is also being built.

Approximately 19,400 square yards of 6-inch reinforced-concrete lining is being placed in the canals and spillway sections. This work was subbed to Harold Ashton of Tucson, who is also building the gate house. Little difficulty was expected from the concrete portion of the work, because it was a straight placement problem.

The new flood-control system was designed for the Pima County Board of Supervisors by the Tucson-Phoenix consulting-engineer firm of Johannessen & Girand, which is also controlling field engineering and inspection. Bruce B. Ellis, Pima County Engineer, also looks the project over as the work progresses.

Interesting Dirt-Moving

Construction of the earth levee and channels was interesting for two reasons. High-speed earth-moving by conventional excavating units was one of the highlights. The other was the manner in which borrow from the reservoir area was whipping the situation which made the project necessary in the first place.

The reservoir area had a solid mat of cemented caliche hardpan about 2 feet thick within about 3 feet of the surface of the ground. That hardpan layer always prevented

Morse-Starrett
WIRE ROPE CUTTER

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FASTER...
Especially designed cutting blade and dies assures fast cutting action... The hammer principle eliminates any special skill requirements.

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No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

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Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1-1/16 inch, 1½ inch.

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Permanent Buildings with the Economies of Prefabrication

USF All Steel UTILITY BUILDINGS

- 26′ and 30′ clear span widths
- 10′ and 12′ heights
- Any length in multiples of 13′-6″
- Suited to side-by-side multiple construction

No cutting . . . no fitting . . . no welding or riveting in the field. USF All Steel Utility Buildings have formed steel columns and trusses that bolt together and the balance of the building is attached by the famous USF "Clip and Wedge" method which requires no holes in sheets. Only simple tools are required. Erection costs are often reduced up to ½ by this method. Six types of standard wall panels give full versatility to designs for your specific purposes.

WRITE FOR BULLETIN

USF UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO
PRODUCTS: Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells • Highway Guard Rail • Bridge Flooring • Corrugated Metal Pipe

An International TD-24 with ripper uses the TD-24's push block to good advantage by giving this Bucyrus-Erie scraper and TD-24 tractor a boost in the borrow pit. *Ray Day Photo*

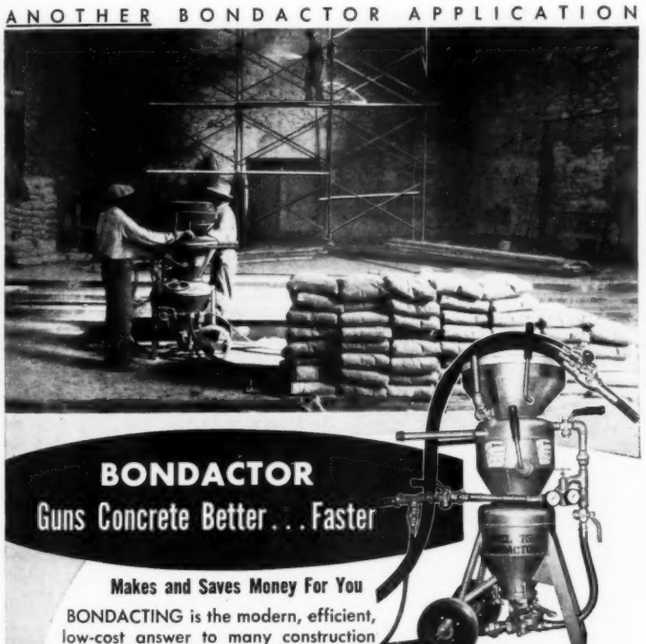
floodwaters from soaking down. Below this formation, however, the cementation diminished, and even some sand and gravel were found. Pioneer's dirt crew ripped this entire caliche bed to pieces and used it in the levee, leaving a good reservoir bed which will undoubtedly train much more water underground than it ever could before.

Pioneer assigned its field work to C. W. "Red" Ashworth, a dirt-moving stiff known all over the southwest for some of his high-speed feats in the 27 years he has been in the business. Ashworth was the man who worked out a satisfactory system for compacting the tricky soils at Roswell Air Force Base, N. Mex., to 100 per cent compaction. He lived up to his reputation on the flood-control assignment by getting an 80,000-cubic-yard estimate in the first 18 days after Pioneer landed the job.

Ashworth's equipment fleet included three Caterpillar DW10's rated at 10 cubic yards; a Caterpillar DW20 rated at 16 yards; an International TD-18-A with a 15-yard Bucyrus-Erie S-112 scraper; an International TD-24 with a 25-yard Bucyrus-Erie B-250 scraper; and one TD-24 with a LaPlant-Choate scraper. International TD-24's were assigned to push-cat and dozer work. One TD-24 with a Bucyrus-Erie ripper also had a Bucyrus-Erie push block, and it doubled

(Concluded on next page)

ANOTHER BONDACTOR APPLICATION



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Guns Concrete Better . . . Faster

Makes and Saves Money For You

BONDACTING is the modern, efficient, low-cost answer to many construction and maintenance problems. In many cases, as in concrete build-up work, BONDACTING is the *only* practical solution. Own your own BONDACTOR. Do your own gunning of concrete, refractories, and other cementitious materials. You'll save time, you'll save labor—and *you'll* keep the profits.

Typical BONDACTOR Jobs

Here are just a few of BONDACTOR'S many money-making applications:
• Precast Concrete Wall and Roof Fabrication • Dry Wall Construction • Tank and Reservoir Lining • Refractory and Insulating Concrete • Steel Encasement • Fireproofing • Waterproofing • Pipe Grouting • Wet or Dry Sandblasting.

3 BONDACTOR Models Available

Model 750. Capacity: ½-¾ cu. yd. per hr. Operates with 75 or 105 CFM compressor.

Model 1250-S. Capacity: ¾-1½ cu. yds. per hr. Operates with 105 CFM compressor.

Model 1250-L. Capacity: 1½-3 cubic yds. per hour. Operates with 210 CFM compressor.

Capacities vary with material being gunned and with specific operating conditions.

WRITE TODAY FOR COMPLETE INFORMATION

PLEASE STATE INTENDED USE AND MATERIALS TO BE AIR PLACED.

AIR PLACEMENT EQUIPMENT COMPANY
1005 W. 24th St.
Kansas City 8, Mo.

A Better
CONSTRUCTION BLOCK
for Every Purpose

Scotty "Super Critic" McBlock, approves this star performer

McKISSICK
McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

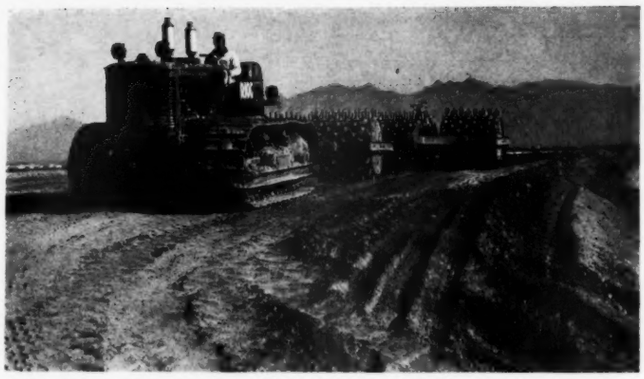
Flood-Control Job Started by County

(Continued from preceding page)

both in ripping and pushing.

Fill equipment included an Adams 610 motor grader, two GMC-truck-mounted water tanks of 2,500 and 3,300-gallon capacity, and a 5-drum Grace sheepsfoot-roller setup pulled as one unit by an International TD-18-A.

The average haul for the entire levee was 1,600 feet for the round trip. There were, of course, some shorter hauls possible as the base of the levee was roughed in with borrow from close by in the reservoir, and the scrapers were used for this work. As the haul settled down to the 1,600-foot average, however, Ashworth used the rubber-tired DW10's and 20's, assigning a TD-24 pusher tractor to two units. Production rolled like clockwork, and in 4 minutes the DW10's made a round-trip cycle which included loading, travel, dump and turn, and return to the borrow pit.



A flock of Grace sheepsfoot rollers behind an International TD-18 compacts levee fill. Water was added both at the borrow and at this point. *Ray Day Photo*

Ashworth's operators dug the scraper bowls in deep, without fearing lack of power, because the weighty powerful TD-24's are, according to Ashworth, the mightiest pusher unit made today. The DW10's regularly picked up their loads in less than 30 feet, whereas it took about 40 feet for the DW20. The huge B-250 Bucyrus-Erie scraper loaded to its control cables in about 125 feet. By putting roller-bearing races inside the scraper sheaves, sheave life was extended by at least 75 per cent.

Ashworth ripped all parts of the borrow area which showed the least bit of cementation. Along with the ripper treatment, water was hauled from Tucson and applied to the borrow pit as well as the fill. Compaction required by the specifications was delivered at 5½ per cent moisture in caliche, with 7 per cent moisture in a clay formation also present. The truck-tankers hauled between 100,000 and 150,000 gallons of water per day to keep up with the dirt-moving fleet.

The material pulverized reasonably well under action of the two-pronged ripper, and worked down to an excellent fill. The lifts were dumped and spread to a thickness of 6 inches by the Adams motor grader, after which time the sheepsfoot roller unit made six passes. Specifications called for 70 per cent density in the levee core, and 85 per cent near the shoulders. The spread was so well organized and the sheepsfoot-roller capacity such that the shoulders were running nearer 90 per cent, and the center was checking out about 96 per cent. The action of loaded vehicles also helped a great deal.

Excavation in the inlet and outlet channels was being handled by a Link-Belt Speeder backhoe, which dug half the ditch and one slope at a time, moving back occasionally to bring up the remaining half. Excavated material was stockpiled on the channel banks. The backhoe did an excellent job of ripping up the hard caliche.

By this month, less than 6 months after his January 6 starting date, Ashworth and his operators expect to have the work finished. Each 9-hour work day—there are five a week—sees 6,500 cubic yards more in place. Only the roughest kind of equipment repair is done in the field because it is a distance of less than a mile from the job over to the headquarters yard and shop of Pioneer Constructors.

Such fast unspectacular small projects as this one contribute much to America's growth. The Tucson dike and reservoir will protect that city from floods for many years to come.

NEW! GORMAN-RUPP
NOW OFFERS THE
BEST DIAPHRAGM PUMP
ever built!

ALMOST UNBELIEVABLE!!
But Here Are The Facts -

- AS MUCH AS 400% MORE PUMPING - at 25 ft. static lift
- DIAPHRAGM LIFE INCREASED 10 TIMES!
- ONE MAN HANDLING—Only 130 lbs. Job-to-Job
- LESS WEAR—EVERYTHING RUNS SMOOTH!

WE CAN SUPPORT THESE CLAIMS!

You are invited to see this pump at work on the job, through your Gorman-Rupp distributor. It is absolutely guaranteed to outperform and outlast any 3-inch pump with single driven diaphragm, comparably powered, now on the market.

Features of First Real Improvement Ever in Diaphragm Pumps

Suction accumulator! Pumps more. Runs smoothly! *EXCLUSIVE — another G-R First!*

Diaphragm drive rod spring cushioned on down stroke. Less shock! Less strain! Less wear! *EXCLUSIVE — another G-R First!*

Hook and tighten suction and discharge with hose connected. Easy! Quick! One man handling. *EXCLUSIVE — another G-R First!*

Numerous exclusive features entirely new in diaphragm pumps, under patent applications.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

J. C. GORMAN ANNOUNCES SENSATIONAL PUMP.

Our GORMAN-RUPP engineers have designed and developed a diaphragm pump as sensational in its field as our GORMAN-RUPP Self-priming pumps are in the centrifugal field. The startling results outlined in our advertisement far exceed any comparable pump now available. This pump is so much better, in so many ways, that we consider all similar pumps and performance of same to be obsolete. We know that our claims seem fantastic—as much as 400% more pumping at 25 feet static lift, — the longer diaphragm life, — the lightness of weight, — the smooth easy flow. But these claims are facts! Facts that we absolutely guarantee to be true, and we will gladly demonstrate our pump at any time to prove these facts!

This new GORMAN-RUPP Diaphragm pump has been running nearly 400 hours under typical job conditions. It is operating at a 12 foot suction lift and a discharge head of 25 feet. The pump is operating smoothly and easily. Pumping volume is greatly increased, fuel consumption is less, suction line flow is smooth. Shock, strain and wear common in diaphragm pumping are virtually eliminated.

I would like to have more information on the GORMAN-RUPP Diaphragm pump.

Name.....

Firm.....

Address.....

City & State.....

☐ Literature ☐ See pump on job

ROAD BUILDERS — IT'S SENSATIONAL!
DRAGS **PECKERWOOD** DRAGS
STEEL SPRING WIRE ROAD BROOMS
MADE IN ANY C-O-N-T-I-N-U-O-U-S LENGTH UP TO 12 FEET
WIDTH 6 INCHES—IT'S DIFFERENT
ASSEMBLE YOUR OWN—IN ANY SHAPE REQUIRED—IN MINUTES, NOT HOURS

NO FRAME REQUIRED

MADE WITH KILN DRIED 6" WIDE HARDWOOD AND HEAVY SPRING STEEL WIRES TRIPLE OUT EACH HOLE. NOT STAPLE SET.

THIS IS IT! ORDER NOW

ILLUSTRATION OF 10-FOOT LENGTH
ONLY **$3.50**
RUNNING FOOT F.O.B. KC., MO.
NOTICE! Our 15" length Unit Drag 3" wide with the two bolts that fits your frame, still $2.50 ea.
SINCE **VAN BRUSH MFG. CO.** 1928
327 S. WEST BLVD., KANSAS CITY 8, MO.

New Type Tire Runs On Snow, Sand, Ice

A soft and fat watermelon-shaped balloon tire that allows a vehicle to operate over sand, on soft ground, and over obstructions and rugged terrain has been tested recently by The Goodyear Tire & Rubber Co. The Rolligon, invented and designed by William H. Albee, is operated with air pressures of only 1½ to 5 pounds per square inch and is molded with one ply of rubberized fabric, topped by a ¼-inch layer of gum-rubber tread stock. Though held in position by an axle, it is actually driven by a series of rotating rollers on the under side of the vehicle carriage, which rub against the top surface of the balloon-like structure and roll it along.

Rolligons are not intended primarily to replace tires, but to supplement their use by providing a tire useful in territory where ordinary tires will not operate satisfactorily. The company points out that the Rolligon principle is a new transportation idea, differing in many respects from the conventional wheel. Whereas a wheel requires a prepared or relatively firm smooth surface for efficient operation, the Rolligon with its low pressure inflation operates efficiently over unprepared, soft, or irregular surfaces. The thin walls of the new tire are extremely pliable and conform to the shape of obstruction over which they pass, swallowing up the irregularities of uneven surfaces, instead of offering resistance to them as do conventional tires. This cushioning effect eliminates the need for springs and absorbs all shocks, providing a floating ride for passengers and heavy loads. Preliminary trials are said to indicate that vehicles equipped with the new tires will develop more than half their weight in drawbar pull on loose dry sand.

For further information write to C. J. Ford, Aviation Products Division of The Goodyear Tire & Rubber Co., Akron 16, Ohio, or use the Request Card at page 18. Circle No. 18.

Air Reduction Manager

D. E. Dallman has been appointed Manager of the Minneapolis, Minn., district of Air Reduction Sales Co., a division of Air Reduction Co., Inc., a producer of welding and cutting equipment and industrial gases.

Mr. Dallman has been with the company for 18 years, most recently in the capacity of Assistant District Manager in Minneapolis.

Judging by the "victim's" expression, this is not a serious accident. Luckily it's a Rolligon that's going over him—a soft balloon tire that conforms to the shape of every obstruction it passes over. The Goodyear Tire & Rubber Co., Akron, Ohio, makes it.

Earth-Moving Literature

A new 48-page book covers all the types of earth-moving equipment manufactured by the Euclid Road Machinery Co., 1316 Chardon Rd., Cleveland 17, Ohio. It also contains information on the selection of the proper type of equipment for various types of work and explains how twin-power—two engines powering separate axles—is used in some models.

The complete line of Euclid rear-dumps, bottom-dumps, scrapers, and loaders is illustrated along with job views of them at work. Brief specifications and typical performance figures are given for the various models and individual design features are explained.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 42.

NOW! Completely new FORD TRUCKS for '53

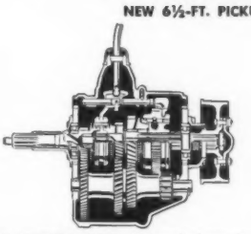
Scores of brand-new, TIME-SAVING features in the completely new Ford Trucks for '53 add a new dimension to truck economy. And you can choose from over 190 models in a greatly expanded line.

Ford Trucks are leaders in *low first cost* and *low running costs*. They last longer for *low ownership* costs. Now for '53, new TIME-SAVING features cut trucking costs still further.

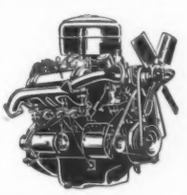
NEW 6½-FT. PICKUP box has new rigid, clamp-tight tailgate.

NEW "DRIVERIZED" CABS cut driver fatigue! One-piece curved windshield 55% bigger. I-REST tinted glass (extra cost). Wider seat with counter-shock seat snubber.

Deluxe cab shown in all illustrations



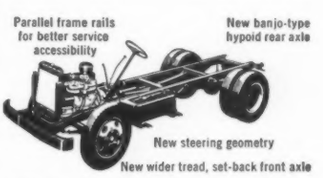
NEW SYNCHRO-SILENT transmissions for easier shifting—no "double clutching"—standard all models. New *Fordomatic* or Overdrive on F-100 at extra cost.



NEW LOW-FRICTION POWER in 3 overhead-valve engines—*Cost Clipper* Six, *Cargo King* V-8's. Five engines in all with famous Truck V-8 and Big Six.

NEW SHORT TURNING for better maneuverability. New wider tread gives 37° steering angle. New set-back axles shorten wheelbase, improve weight distribution without reducing capacity.

NEW SPRINGS! NEW BRAKES! Longer front and rear springs for easier ride, longer life! New self-energizing brakes for better control . . . double-cylinder type, rear, on Series 500 and 600.


Parallel frame rails for better service accessibility
New banjo-type hypoid rear axle
New steering geometry
New wider tread, set-back front axle

NEW TIME-SAVING FEATURES THROUGHOUT! All new . . . all the way! New fast controls and new power save truck time on the road . . . New service accessibility saves truck time in the shop.

BIGGEST FORD TRUCK ever built—new Ford Series F-900 has G.C.W. rating of 55,000 lbs. as a tractor and G.V.W. truck rating of 27,000 lbs.

Designed for today's hauling needs!

FORD *ECONOMY* TRUCKS

SAVE TIME! • SAVE MONEY! • LAST LONGER!

Good Drivers Drive Safe Trucks

FREE! MAIL THIS COUPON NOW!

FORD Division of FORD MOTOR COMPANY
P.O. Box 658, Dearborn, Michigan

Please send me without charge or obligation, complete details on new Ford *Economy* Trucks for '53!

FULL LINE ☐ HEAVY-DUTY MODELS ☐
LIGHT MODELS ☐ BIG JOB MODELS ☐
PARCEL DELIVERY ☐ CAB FORWARD MODELS ☐

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WON'T QUIT or cause time out

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

The Hayward Company
32-36 Dey Street
New York, N.Y.

Hayward Buckets

Line of Truck Mixers

Challenge truck mixers are now offered in sizes ranging from 3 to 6½ cubic yards, thus making possible the proper selection of mixer and truck for the specific operation at hand. The wider range of sizes allows greater utilization of the load-carrying capacity of the truck within highway weight-limit laws.

The 3 and 3½-cubic-yard mixers are said to be finding use in rural areas and for outlying residential work. Both can be mounted on a 2-axle truck, providing the advantage of short wheelbase and ease of handling over sidewalks, driveways, and in close quarters. According to Cook Bros. Equipment Co., 3334 San Fernando Road, Los Angeles 65, Calif., the 3½-cubic-yard unit legally carries an extra ½ yard of concrete on a 2-axle truck.

The 4-cubic-yard truck mixer, when mounted on a heavy-duty 2-axle truck, will carry 4 yards of concrete on specification pours. Under a premix plant it is capable of carrying 5 yards of concrete, if the truck has sufficient capacity.

The 6-½-cubic-yard Challenge truck mixer is recommended for off-the-road operation.

The 5-cubic-yard mixer, although mounted on the same type of 3-axle 6 x 4 truck used to carry most 4½-yard mixers, provides an extra ½ yard of payload per trip, whether on specification or regular pours, the manufacturer states. In most states this model is said to carry 5½ yards of concrete legally when mounted on a truck equipped with tandem drive and weighing approximately 11,000 pounds.

A 6-cubic-yard unit that is said to weigh nearly a ton less than many 5½-yard mixers provides an additional ½ cubic yard of payload capacity. This size is adaptable to conventional trucks, where physical and legal restrictions prevent the use of larger mixers.

Mounted on special trucks, such as Cook Bros. M-310, the 6½-cubic-yard model can haul its full rated capacity legally in some states. This size is recommended for off-the-road operations, or where state weight-limit laws are not a restricting factor.

For further information write to the company, or use the Request Card at page 18. Circle No. 94.

Vermont Cuts Trees As a Safety Measure

During the past winter months, maintenance crews of the Vermont State Highway Department were kept busy cutting trees which grew too closely to the traveled portion of state roadways.

This program was primarily a safety measure to remove obstacles contributing to the seriousness of accidents. The work, under the direction of the Department's twelve district engineers, was being done on a state-wide basis whenever maintenance crews were not plowing and sanding.

Trees on inside curves reduced the distance drivers could see ahead, and made passing impossible. For safe stopping, at present-day speeds, a continuous-sight distance of at least 500 feet is desirable. Numerous accidents had been caused by drivers hitting trees growing near the highway.

People who felt that valuable scenic attractions were being destroyed were reassured by the Department, which explained that trees at the very edge of a road, aside from being dangerous, spoil the view.

Mine Safety Director

Samuel B. Casey has been elected a member of the Board of Directors of Mine Safety Appliances Co., Pittsburgh, Pa. Mr. Casey, among other positions, holds that of Chairman of the Board of Swindell-Dressler Corp., John F. Casey Co., and New Castle Refractories.

In Pittsburgh, the whole city watched with pride as these three 20-story buildings went skyward, in the redevelopment at the point of the Golden Triangle.

The contractors, using preassembled exterior wall units, took every precaution to assure both speed and safety on these widely-publicized jobs. Wall panels, weighing 1000 to 6000 lbs. each, were lifted into place by American Stiffleg Derricks. Lifting power was supplied by the most rugged, reliable, trouble-proof hoists obtainable . . . world-famous American General Purpose Hoists.

When you see these smooth, tireless Americans on so many outstanding jobs throughout the world, you realize that most top-flight contractors agree on two points. First, they know that the hoist is *the heart of the job.* Second, they know that there is no other hoist so smooth, fast and dependable as an American. Let your American Hoist distributor help you find the right size and type for *any* need.

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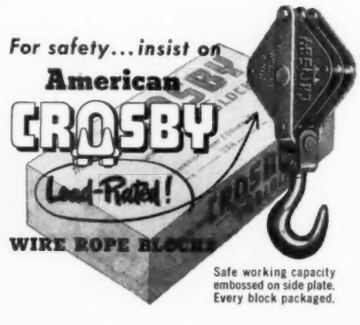
Modernize...economize...with

American Hoist

AMERICAN HOIST & DERRICK CO. • ST. PAUL 1, MINN.

For safety...insist on
American
CROSBY
Load-Rated!
WIRE ROPE BLOCKS



Safe working capacity embossed on side plate. Every block packaged.

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— FOR —
Rock Drills, Pavement Breakers and Clay Diggers

Vulcan Tool Manufacturing Co.
35-43 Liberty Street, Quincy 69, Mass.
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57 Leonard St. 34 No. Clinton St.
New York 13, N. Y. Chicago 6, Ill.
Send for catalog or see your local distributor.

Distributor Doings

"State" Covers a Big State

Shortly after the end of the busy 1952 construction season, a road-building contractor walked into his repair shop in Prescott, Ariz., and asked the clerk what the year's cost had been for parts replacements on three Euclid scrapers. When the clerk answered, "One control cable covers it all," the contractor was astonished.

"I knew our 'Eucs' were good machines", he said, "but I didn't know Howard Ramey was doing such a good job."

Howard Ramey, traveling Euclid service expert who works for the Phoenix equipment firm of State Tractor & Equipment Co., has one of the southwest's loneliest occupations. Roy Robinson, State's President, insists that when a man buys one of the $34,000 Euclids he's entitled to have it looked after occasionally. So Ramey travels the state of Arizona, sometimes for weeks at a time, checking on contractors' equipment. He is also available to perform service work on order, in which case State charges the customer a regular hourly fee. But when Ramey makes his traveling calls to inspect the various units and keep them in adjustment, the calls are free.

Roy Robinson's service policies, now being pushed just as vigorously by his son, J. R. Robinson, Vice President of State, are paying off. Contractors on State's customer list include some of the biggest names in Arizona contracting: names like Fisher Contracting Co., Wallace & Wallace, W. J. Henson Co., and Arizona Sand & Rock Co. Last year State's sales and service methods grossed about $5,000,000 for the company, and resulted in a lot of work for the State of Arizona which needed doing.

State covers Arizona like a rug. Take a trip out into farming country, and you'll find farmers with Superior engine-driven Fairbanks-Morse deep-well-pump setups, and the chances are that the farmer never even looks at this equipment because of State's unique regular flat-fee service policy. Visit one of the highway jobs where the heaviest type of equipment is blasting a path through sheer granite, and the chances are good that State will have placed some Euclid scrapers, an Adams motor grader, or a fleet of big red International TD-24's, the world's most powerful tractor. Travel on down into mining country, where ore-mining operations go on 24 hours a day, and you'll find parts-inventory setups in the remote mining locations controlled and serviced by a State parts expert. Almost every high-type asphalt-paving job in the territory uses Barber-Greene laydown machines straight out of State's unpretentious showroom.

State's principal accounts cover construction, farming, mining, and industrial equipment. Names like International Harvester, Adams, Euclid, Hough, Barber-Greene, Bucyrus-Erie, Ingersoll-Rand, Roeb-

(Continued on next page, col. 3)

The main show room of State Tractor & Equipment Co. is big enough to accommodate this TD-24 International crawler tractor, along with an Adams motor grader and some power-sawing equipment. *Ray Day Photo*

DRILLING CONTRACTORS

Diamond and Shot Core Borings, Dry Sample Borings, Grout Holes and Pressure Grouting, Foundation Testing for Bridges, Dams and all Heavy Structures

Manufacturers, also, of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits.

Write for Catalog No. 320

SPRAGUE & HENWOOD, INC.

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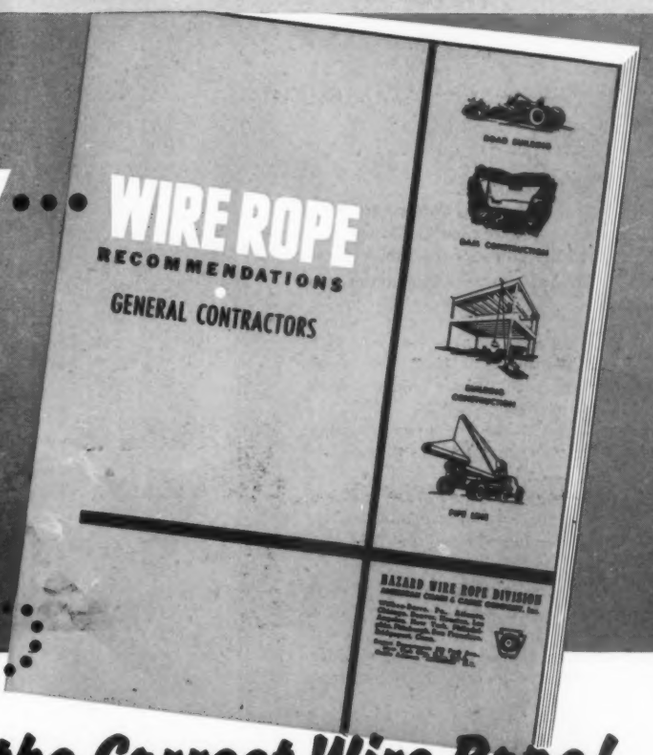
LAY-SET Preformed WIRE ROPE

new... an easy way for you to always...



Select the Correct Wire Rope!

• In this **NEW** 16-page booklet, HAZARD makes it easy for you to select the best, the correct wire rope for every piece of equipment used by general contractors.

You'll find large photographs of crawler cranes, clamshells, hoists, derricks, scrapers, yes, even cableways. You'll find alphabetical listings of each machine with recommendations of the correct wire rope for the longest wear . . . and lowest service cost.

These recommendations are based on long experience of contractors who used LAY-SET Preformed "Green Strand" Wire Rope all over the country. They worked on dams, excavations, strip mines, road building, and the many other jobs general contractors do day in and day out.

Get a copy of HAZARD *"Wire Rope Recommendations for General Contractors"* from your local HAZARD distributor, or write our Wilkes-Barre office. Ask for Booklet **129-B.** And—when you need wire rope, ask for and *get* HAZARD LAY-SET Preformed Green Strand Wire Rope.

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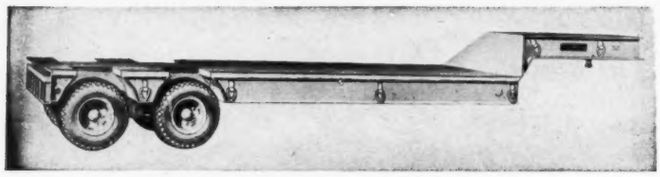
Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

makers of ACCO Registered WIRE ROPE SLINGS

SOLVE YOUR HAULING PROBLEMS WITH

A "TRANSPORT TRAILER"

Capacities through 75 Ton—Semi and Full Trailers



CARGO CARRIER MODEL GPX (Semi) with Tandem Axles

PATENTED TANDEM AXLE ASSEMBLY—Featuring unusual lengthwise and sidewise wheel accommodation to irregularities in the road. Use of full width tubular forged, heat treated axles with CAMBER.

FRAME—Constructed of beam sections throughout, electric welded. A ruggedly strong and efficient unit with minimum weight.

TRANSPORT TRAILERS, INC.

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CEDAR RAPIDS, IOWA, U.S.A.

MORE CONTRACTORS BUY MARLOWS

FIRST CHOICE...

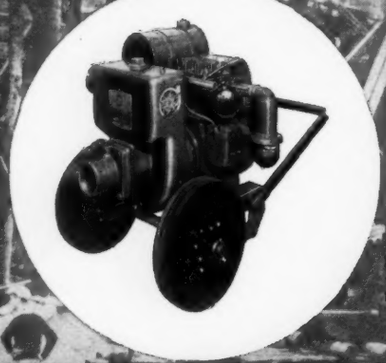
of contractors by a wide margin, are Marlow pumps... built to meet the tough and exacting requirements of the job.

Marlows' have the features that contractors demand.

- *Simplicity of construction,* with a minimum of parts, for better operation, lower maintenance and longer life.
- *Faster, and more dependable priming* even at high suction lifts.
- *Ability to handle trash* without clogging or losing prime.
- *High efficiency and low fuel cost.*

All contractors' pumping needs are more dependably handled with just two types of Marlows — Marlow Self-Priming Centrifugals for high capacity pumping — Marlow Mud Hogs for muddy, sandy and trash laden water.

Buy Marlow and get the best in pumping performance. For complete information see your Marlow dealer or write for "Marlow Contractors Pumps" bulletin C-52.



Marlow manufactures the world's largest line of contractors' pumps.

313

MARLOW PUMPS

Other factories in France and England

RIDGEWOOD, NEW JERSEY

Branch Plants: DeQueen, Arkansas; West Chicago, Illinois

Distributors and Dealers everywhere

Distributor Doings

(Continued from preceding page)

ling, Fairbanks Morse, Superior natural-gas engines, and allied names are on State's roster. Many of the names are carryovers from the old days prior to 1941 when Roy Robinson founded Westmont Tractor & Equipment Co., up in Missoula, Mont. Big accounts like International, for example, are split. State covers ten Arizona counties with International industrial engines and tractors, while the rest of the state is covered by other Harvester distributors at Tucson and Yuma. And International farming equipment is something else altogether, not handled by State. State sticks to heavier types of machinery.

Two years ago, for example, State handled a $670,000 single order, its biggest. Kennecott Copper Corp. placed the order, which called for a fleet of 15 Euclid FFD hauling trucks—the 32-yard machines, equipped with Allison torque converters—for hauling copper ore in one of its mines at Ray, Ariz. When orders like that one loom on the horizon, it's a safe bet that the sales conference room upstairs over the main office will see some activity.

Tight Organization

State is not too decentralized in its organization, and even though Roy Robinson has reached the age when he has to take care of himself, it is plain to see that he still keeps the ship of State somewhere near the middle of the business channel. Most of the routine direction as well as considerable policy making is now done by Jack Robinson, who bids fair to carve out a reputation for himself in the equipment business. Not too much other authority is delegated, except on routine matters. Field men are given what authority they need, but regular meetings of sales and service people keep company policies uppermost in their minds.

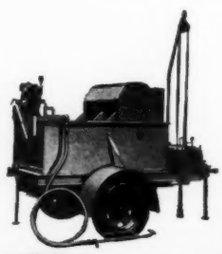
Key officials of State, in addition to the father-and-son Robinson team, include Secretary-Treasurer W. H. Bridges; Parts Manager J. A. Sumpter; Service Manager John Black; Euclid and TD-24 Salesman Earl Bodine; and Pump Department Manager Riney Lau. Salesman C. R. Templeton concentrates on city, county, and state sales, while George Gates concentrates on other sales in the Phoenix-Yuma area. Staff salesmen Arthur Hazelwood and Edward Gouyd keep close to buying prospects in the Flagstaff and Tucson areas respectively.

Vice President J. R. Robinson discusses with his father, Roy Robinson, President of State Tractor & Equipment, many of the policies he carries on in the firm. *Ray Day Photo*

For Cement Work **YOU CAN DO A BETTER JOB WITH A MACRETE Gun**

For the application of a mixture of hydrated sand and cement by compressed air.

In comparison with hand application of cement work, the MACRETE GUN is not only faster and more economical but gives a higher quality coating. Tensile strength will range from 10% to 200% better than hand work, and compression strength is even more marked—up to 700% greater, and with less voids. Adhesion is increased at least 25%. The MACRETE GUN comes complete with all fittings and accessories—ready to use.



MACLEOD

Heavy-Duty, Oil-Fired

TAR KETTLES

Available in range of sizes from 110 gallon to 800 gallon capacities.

The sturdy Macleod kettle has a return system for the heat from the burners with a separate section for the melted material. Inner kettle is constructed of ¼" thick steel and bottom of furnace is insulated to prevent heat loss.

Write Dept. CE for descriptive literature and prices.

The MACLEOD Company

BOX 452, SHARONVILLE, OHIO ESTABLISHED 1897

Small branch stores are maintained in Tucson and Eloy. The Tucson branch has a small parts stock, a salesman, and a service man.

Traveling Service Man Howard Ramey's job is of course one of the most unusual on the staff. Through mountains and desert, through pine-covered forests and growing farmlands, in sand and dust and wind and snow, Ramey travels Arizona. Although he gives all State-sold equipment the once over, the Euclids are his particular baby. Ramey often can make suggestions which result in upped production, and can spot trouble while it is still in the adjustment stage, before expensive repairs are necessary. His route from Phoenix usually follows a natural loop, but once in a while Ramey will double back or hop over a few places of call when emergencies arise. During the active construction season, he tries to see State's customers at least once a month. And with the exception of the high mountainous country in northern Arizona, most of the state is open to construction crews the year round. Ramey's traveling inspections are credited by many of the contractors with noticeably reducing their repair bills, and for getting jobs out on schedule because equipment ran steadily.

In dire emergencies—and there have been a few—Jack Robinson can load up to 300 pounds of freight into his Cessna 170-B plane and take off for field jobs. Many customers, too, like W. J. Henson, Prescott & Fisher Contracting Co., Phoenix, Ariz., have their own planes. Plane travel is often used from remote points back from the main highways.

Geared for Efficient Service

Roy Robinson has been in the equipment - distribution business since 1930, so State Tractor & Equipment Co. reflects many of the lessons of experience. For example, he laid out the administration area so that he can see into every office and sales room merely by turning his head. Thus he can see what goes on in every sales office, can spot customers he wants to see, and he never calls anyone on an inter-office phone without making sure with a glance that the man is in his office.

Indexed parts-inventory cards show a precise running account of stocked items. Parts Clerk Carmen Mesa was busy on a Friday morning when C. & E.'s camera stopped by her station. *Ray Day Photo*

Robinson set up State back in 1940, and bought out the Brown-Bevis (Los Angeles) branch store then located in Phoenix in 1947. The main office and yard is located near the State Capitol building at 407 South 17th Avenue. The front of the building and the showroom are in keeping with the architectural dignity of this street, while the yard area behind the building is strictly unpretentious. About 4 acres of storage space is available on the grounds.

The main building houses a big showroom where equipment up to TD-24 tractors is displayed, all sales and administrative offices, parts rooms for small stock, a pump service and sales room, conference and direct mailing rooms. The front office section connects directly to a heavy equipment repair shop in the rear, where almost any kind of major repair job imaginable can be done on heavy equipment. Specialized sub-shops, such as an electrical service room and an injector testing and service room, are a part of this main shop.

One of the efficient features of the layout is a 60 x 160-foot covered unloading dock, where shipments can be received by rail or truck. A railroad spur leads alongside the platform, and a car stop at the end of the spur terminates in a reinforced-concrete ramp, where tractors or motor graders can be driven off from the freight cars. Equipment up to and including the big 440-hp Superior natural-gas engines is stored on this platform, at least temporarily. Much equipment which is scheduled to go right out to the customer can be held easily here for a few days.

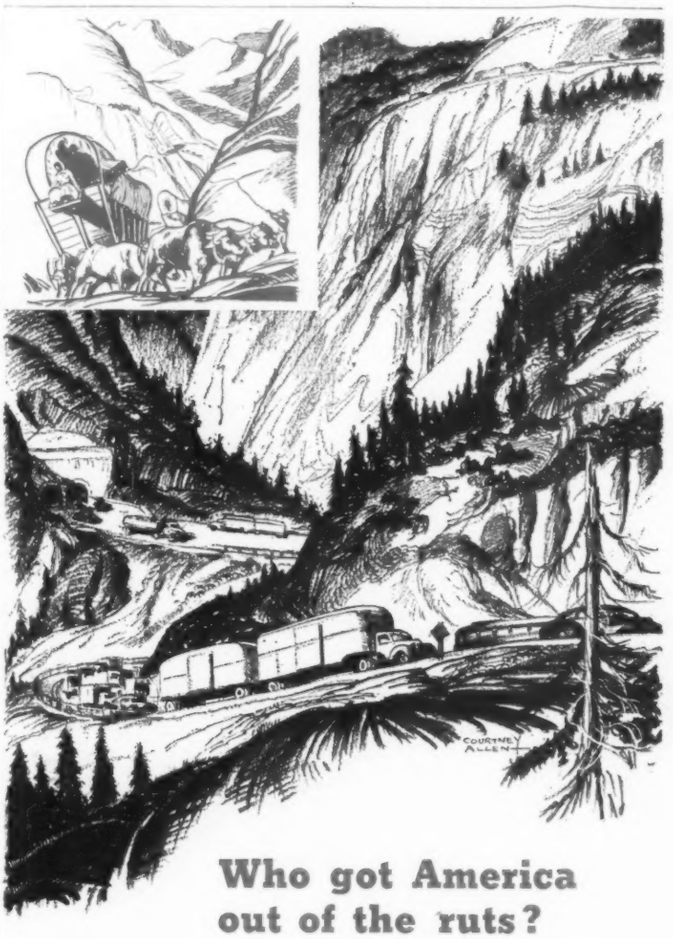
There is a separate welding shop, too, and whenever the welders get caught up they work on fabricated steel-frame sheds, which farmers buy to house deep-well pumps. These small sheds are rectangular, about 10 x 15 in size, and are covered with sheet metal. They retail for about $350 apiece, do the farmers a service, and keep the welders occupied in their spare time.

Parts are carefully handled, and continuous Kardex records show exactly what is on hand even while customers are doing business out in the front office. Small parts are placed in neat steel bins, while bigger items are stored in a separate shed. The parts room and the heavy-equipment repair shop both have alternate panels of plastic roofing which admits a lot of light, and there are no days when the lights have to be turned on in these areas.

Looking around the place, you get the impression of neatness and efficiency, and you notice that customers who come in for parts seem to feel the same way.

Arizona's contractors are a pe-

(*Continued on next page*)



Who got America out of the ruts?

For the pioneers, cross-country travel was back-breaking, slow and laborious. Today, travelers and truckers, agricultural and industrial products, roll easily over thousands of miles of arterial highways. The outstanding building ingenuity and tremendous drive of America's contractors have smoothed the way across rugged mountain barriers, plains and deserts.

Progress and construction go hand in hand — and the Ætna Casualty and Surety Company is proud of the tremendous importance of the industry which it serves. Ætna's facilities are available to you everywhere, for all projects, big and small. Ætna's bond men are informed and efficient—ready and able to give you prompt service. That is why so many contractors bond with *Ætna* — always.

No job too big--no job too small

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ARNOLD LUBRICATOR AUTOMATICALLY OILS AIR TOOLS

Thus cuts maintenance costs, reduces downtime, prolongs tool life

Oil flow from Arnold Lubricator starts when air tool starts, stops when tool stops, automatically lubricates all working parts. Oil flow easily adjusted to tool needs. Can be filled under line pressure; window tells you when.

Light weight. Easily installed in hose line or on bench. Streamlined to prevent catching. No moving parts to get out of order. 4 sizes. Order from your equipment dealer TODAY, or write us for leaflet and prices.

Dealer inquiries invited.

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Distributor Doings

culiar breed, in that most of them have their own headquarters shops, their own mechanics, and seldom hire anyone to do their repair work. At the same time, they depend to a considerable extent on their equipment distributors to keep a stock of repair parts. Most of State's customers operate this way, and practically at any season of the year they can be expected to make calls for parts. As a result, State maintains a tremendous parts stock, about as complete as any which will be found in the southwest.

Many of the mines in Arizona run night and day, and their managers realize the importance of keeping repair parts on hand at the site. The Euclid order for Kennecott, for example, was accompanied by an $80,000 parts order. In order to keep the mining companies up to date on their parts stock, a State representative makes regular inspection visits to the various mining locations, and audits the spare-parts stock. This service is, of course, free to the mining company for the business it brings in to State. As a rule, every repair part which falls in the "highly expendable" category can be found in these field parts rooms.

Farmers or landowners have a different problem entirely. They seldom have space or time or help to stock repair parts and service their equipment, particularly the deep-well pumps which State installs for them. To meet their special need for dependable service, State for a flat monthly fee sends trained service people around at regular intervals to service the equipment, do lubrication and repair, and keep the equipment in top-notch condition. This flat-fee plan appeals particularly to the farmers' hard-headed business sense, because they realize State can't very well make much money on the account if service work is neglected on these machines. Only by giving the best of service can these flat-fee deals work for State.

Good Years Ahead

Both Roy Robinson and his son Jack are optimistic about immediate business prospects in the years ahead. Arizona is one of the west's growing states, as the nation's population gradually shifts away from the east coast. Construction prospects were never brighter, and even a curtailment in reclamation work—bad as that would be for Arizona equipment distributors—would still find State doing business at the same stand.

Currently before the U. S. Supreme Court is the famous Arizona-California controversy to determine how much Colorado River water, if any, Arizona is entitled to for use on the Central Arizona reclamation and irrigation project. One thing is certain: Arizona needs additional water from somewhere to meet her growing needs, and if the Central Arizona Project is authorized for construction, it would call for Colorado River diversions at Marble Canyon. The delivery system would call for pump lifts higher than the Empire State Building, for hundreds of miles of canals and tunnels. In the estimated $1 billion construction cost there would be plenty of new business for a house like State.

In the meantime, on the theory that some of the fat at least will be cut from the construction picture, State is emphasizing a return to good salesmanship along with its own sound service policy. The day of order-taking by telephone is about gone, according to Roy Robinson, and he for one feels perfectly confident about the future because he did well during the 1930's when things were really tough.

Robinson looks forward to the introduction of more new equipment, and to increased competition between distributors and manufacturers alike. When it comes, he can live with it.

And in the meantime, every sales and service meeting emphasizes the importance of giving State's customers the best possible break on business relations, even in hectic times like the present.

Equipment Distributor in India

At a ceremony in Delhi, India, over which Dr. Punjab Rao Deshmukh, Indian Minister for Agriculture, presided, a new display and service headquarters was opened for a machinery and equipment distributor. Willcox (Buckwell-India) Ltd., will be the distributor in northwest India for Caterpillar tractors, Gardner-Denver air compressors, pumps, etc., and equipment from other American and British manufacturers.

The new service center includes office space, a parts department, workshops, and covered storage areas, as well as facilities for the repairing and overhauling of agricultural and construction equipment.

Nussmeier Is Euclid Specialist

W. H. Anderson Co., Detroit, Mich., distributor of construction equipment, announces the appointment of a Euclid equipment specialist for the company. He is Robert A. Nussmeier, whose full time will be devoted to advisory work and consultation regarding in-

Why operate big, oversize compressors ?
The DAVEY Model 105 is the smallest, lightest 105 c.f.m. 2-stage compressor available today!
There's no sense to hauling around a cumbersome, heavy old style 105 ft. compressor. You can use a new, lightweight Davey and get more air per lb. of fuel along with greater service dependability and longer life.
Because Daveys use weight-saving "Cool Oil" aluminum alloy crankcases, they are lighter in weight. And, they are engineered to make maximum use of every inch of length—so skillfully that they give you a 6-cylinder engine with hand clutch in less space than many 4-cylinder powered clutchless units.
Davey's new Multi-Port Valves never carbon or foul . . . deliver more air per lb. of fuel . . . keep tools operating at maximum efficiency.
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DAVEY Multi-Port Valve ASSEMBLY
"more air . . . less fuel"
Tests indicate that Davey's ultra low lift, Swedish steel valves make possible consistent fuel savings up to 21 percent.
Built to operate efficiently and economically with ample reserve capacity
The Davey Model 105 is designed to produce 105 c.f.m. at its most efficient operating speed in accordance with established Compressed Air and Gas Institute standards. However, the compressor possesses tremendous reserve capacity as shown by graph at left.
AIR DELIVERY C.F.M.
130
125
120
115
110
105
INCREASE IN AIR DELIVERY
1150 1200 1250 1300 1360 1410
COMPRESSOR R.P.M.
Davey Model 105s have been America's lightest weight, most compact 105 ft. portables since 1944.
Ask your Davey Distributor for data on standard 60 to 600 c.f.m. Davey portable and industrial compressors; Auto-Air (truck-mounted compressors); Mobile Machine Shops and Field Service Units.
DAVEY
pioneers of air-cooled air
DAVEY COMPRESSOR CO. • KENT, OHIO

dustrial and construction engineering of material handling and movement by Euclids.

Several years of experience with the Euclid Road Machinery Co. will aid him in his work with Michigan industrial and construction firms.

Hyster Dealer in New Jersey

R. E. Brooks Co., of Hasbrouck Heights, N. J., has been appointed exclusive sales and service representative in northern New Jersey for Hyster industrial-truck equipment.

The territory to be served by Brooks includes twelve northern New Jersey counties.

Allis-Chalmers Distributor Named

George L. Smith & Co., 6450 W. River Parkway, Milwaukee, Wis., has been named a distributor for Allis-Chalmers motors and centrifugal pumps.

The area served by the firm includes nine counties in the northern and western portions of Wisconsin, and seven counties in the upper peninsula of Michigan.

Matcha Distributes Warco in N. J.

As a new Warco distributor, Matcha Machinery Co., Budd Lake, N. J., will handle road graders and Hercules road rollers. It will sell and service the 4D-85 (85-hp) and the 4D-100 (100-hp) motor graders in the Warco line produced by W. A. Riddell Corp., Bucyrus, Ohio.

Henry Matcha heads the New Jersey dealer organization.

Ray-Brooks Is Euclid Distributor

The Ray-Brooks Machinery Co., with headquarters at Montgomery, Ala., and a branch at Mobile, Ala., has been named by Euclid Road Machinery Co., as a distributor of its earth-moving equipment. The area covered is Southern Alabama.

New Cleco Dealers in Northeast

Cleco Division of Reed Roller Bit Co., Houston, Texas, manufacturer of the Cleco and Dallett lines of air tools and accessories, has appointed three new distributors in the northeast. They are: Maintenance Services Co., 112 Academy St., S. Orange, N. J.; Detroit Supply Co., Inc., 113 S. Brandywine Ave., Schenectady, N. Y.; and Sears & Bowers, 411 Spring Garden St., Easton, Pa.

Timber Units in New Building

Howard Cooper Corp., distributor of contractors' and road equipment, has opened a new commercial building in Portland, Oreg. Timber Structures, Inc., used glued, laminated timber units for the building.

Faster, easier loading . . . because A-C Motor Scrapers have up to 20 hp. to handle every struck yard . . . plus offset cutting edges and "center-boiling" loading action that spills the dirt evenly, filling corner voids for full capacity loads.

How Allis-Chalmers Motor Scrapers help Cut Cost per Yard by Cutting Time per Yard

High-speed hauling. The power behind the TS-300 teams up with big, traction-type tires that gear it to the road . . . move capacity loads at 22.5 mph. And operating clearance of 20 in. helps keep it from hanging up on rutted haul roads.

Positive, forced ejection . . . eliminates wasteful circling or other time-consuming methods of removing the load. Allis-Chalmers' patented forced-ejection system plus high apron lift *bulldozes* dirt out of the bowl fast every trip . . . without extra wear and tear on power control unit cables and clutches.

Easy operation. From foam rubber seat to finger-tip control, shock-free hydraulic steering and full visibility, a TS-300 operator has every available help for safe, sure, speedy work. Balanced weight distribution and low center of gravity make A-C Motor Scrapers easy to maneuver even at top speed.

A dirt-moving "package" that makes every second count. The powerful HD-20 torque converter tractor is an ideal teammate for the TS-300. It synchronizes to scraper speed at contact . . . automatically loads at fastest speed conditions permit with less strain on operator and equipment . . . gives scraper an extra fast start to the fill.

TS-300 MOTOR SCRAPER
14 cu. yd. struck capacity
18 cu. yd. heaped capacity
280 hp. Buda diesel or
275 hp. Cummins diesel

TS-200 MOTOR SCRAPER
10 cu. yd. struck capacity
13 cu. yd. heaped capacity
176 hp. Buda diesel or
165 hp. Cummins diesel

Your nearby A-C dealer will be glad to give you more yardage-boosting facts about job-tested, *job-proved* Motor Scrapers. He can also tell you where you can see them at work and talk to the men who own and operate them. You owe it to yourself to call or stop in soon.

THE FINEST LINE ON EARTH

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE 1, U. S. A.

A 6-yard Bucyrus-Erie 150-B shovel strips iron ore and loads into a Mack truck. If contracts were big enough, machines this size might also be used on highway jobs.

Heavy highway fills like this are made to order for big construction equipment. Here a Euclid dumps a huge load on a 100,000-yard fill near the Columbia River in Oregon.

A Joy Heavy Weight Champion drills a hole at a Utah ore mine. It may also have a use on heavy rock excavation jobs.

More Highway Miles With Big Machines

By RAY DAY

• AT a recent $2,000,000 highway letting in a western state which spreads its money thin, Morrison-Knudsen Co. of Boise, Idaho, was unable to make a bid even though its Boise yard was full of equipment. The jobs were simply too small; too spread out to make M-K's bid profitable to the company or attractive to the State. Because of many economic factors probably beyond the control of that State Highway Department, the State was deprived of contractor competition and lowered construction costs possible on bigger jobs.

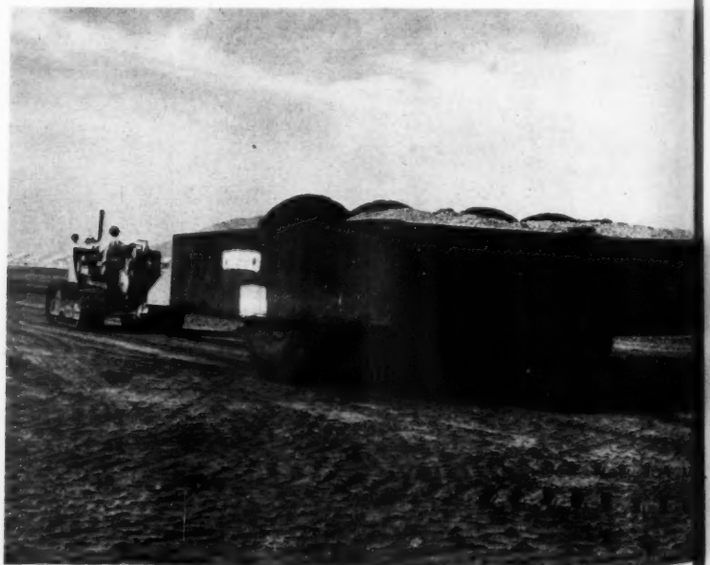
All over the nation in one form or another, this sad commentary on the construction business is being repeated every year. Long stretches of highway need rebuilding in multi-million-dollar increments, but the lack of funds and traditional job sizes more often than usual result in small-scale jobs. Archie N. Carter, Highway Division Manager of the Associated General Contractors of America, has pleaded at American Association of State Highway Officials meetings for a planned spread of big, medium, and small contracts.

"Only by so doing can you make full use of the equipment pools owned by big and little contractors alike," Carter has said. And where his advice has been followed, State Highway Departments have seen some gratifying results.

The Oregon State Highway Commission, for example, let a somewhat bigger than usual contract for reconstruction of a rough, tough section of U. S. 30 in the Columbia River gorge. The job had a few peculiar conditions which caused the successful contractor to try some considerably bigger equipment than is seen on most highway jobs. Not only did this contractor whip some tough construction problems, but he finished the work a year ahead of schedule.

On America's great dams and in her open-pit mines is plenty of big equipment which would speedily build a sizable part of the nation's much-needed highway system if it had the chance. Much of this equipment is owned by contractors—naturally, big contractors. Most of it is highly adaptable to the kind of highway building America needs to

Although the use of Yuba gold dredges like this has been confined mostly to dam building, it could possibly be the answer to a big borrow problem on a highway project.



If jobs were big enough to justify it, big pneumatic-tired rollers like this, shown working at an airport, might be used to compact heavy highway fills.

A 5-yard Bucyrus-Erie 120-B dragline working at Pine Flat Dam near Fresno, Calif. Bigger highway contracts might well utilize equipment like this.

rejuvenate its transportation system. Such equipment is especially well suited for 25 and 30-mile 4-lane divided-highway projects through rough terrain. Yet these jobs are rare. It is difficult to see why this situation should continue to exist.

Could Copy Railroad Construction

In many respects, highway building could once more emulate railroad construction, as it once did almost a century ago. The railroads are now all built, but occasionally one of the railroad companies finds some major betterment to its system economically feasible. Costly though the jobs seem, they are almost always let in one contract. Railroad engineers know they pay for only one contractor mobilization and overhead in that kind of arrangement.

A 27-mile line change on the Northern Pacific was made in record time by this scheme a few years back in North Dakota. In Missouri, sizable line changes considerably bigger than any two State Highway Department contracts have been

(Continued on next page)

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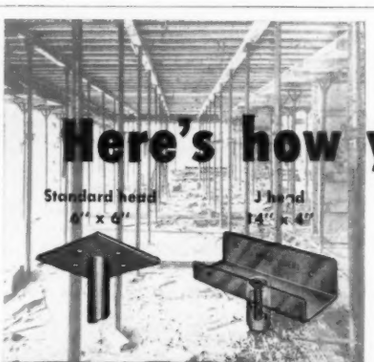

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• Ease in stripping—compact portability
• Head types for every construction job
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Easily set and adjusted by one man
Over 1,000,000 now in use
Exclusive self-cleaning feature
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Adjustable Steel
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GENERAL SPECIFICATIONS

Shore Sizes, Dimensions, Weights, and Capacities

Size No.	Height		Weight in lbs.	Failing Load		Recommended Safe Working Load	
	Fully Closed	Fully Extended		Fully Closed	Fully Extended	Fully Closed	Fully Extended
1	5 ft. 7 in.	9 ft. 10 in.	46	10.96 tons	8.97 tons	8210 lbs.	6720 lbs.
2	6 ft. 7 in.	10 ft. 10 in.	49	10.50 tons	7.90 tons	7840 lbs.	5975 lbs.
3	8 ft. 2½ in.	12 ft. 5½ in.	56	10.15 tons	7.55 tons	7490 lbs.	5600 lbs.
4	11 ft. 0 in.	15 ft. 0 in.	69	7.27 tons	2.89 tons	5800 lbs.	2050 lbs.

Acrow Patented Self-Cleaning Feature

Always ready for instant use. A spur-tooth extension of the collar nut extends over a segment of the threaded tube. Turn collar handle and the encrusted concrete, dirt, and grit are cleaned away. (Illustration above.)

World's Largest Selling Shore

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More Highway Miles With Big Machines

(Continued from preceding page)

rushed through in the past 4 years. A mammoth 42-mile major line change is now under way on the Union Pacific system in southern Wyoming, where 5-yard shovels and 30-ton hauling units are proving their efficiency and economy on a roadbed no wider than the usual highway. It will take about 18 months to build the 42-mile stretch, some of which has cuts 125 feet deep and over. Imagine the duplicating mobilization expense and the time it would take to build such a job as highways are often built: in 4-mile increments.

It goes without saying, of course, that the places where such large-scale construction would fit into a highway system are limited by economic factors, highway-user pressure, and to some extent the availability of engineers. Nothing in this article is intended to urge some sudden shift from small to big jobs. It merely emphasizes the fact that occasional highway jobs of huge proportions could be let profitably to the State.

Less Duplication Lowers Costs

To build 40 miles of modern highway in 4-mile sections, a State loses money and time. It loses money because it pays for 10 separate contractor mobilizations, and it loses many valuable man-hours of engineer time as men stand by in various degrees of idleness during the final or cleanup stages of 10 contracts. A single contractor-mobilization cost for the entire 40-mile job might not save 90 per cent over a 4-mile spread, but it would likely save 30 to 35 per cent. And engineers assigned to studies, surveys, and inspection of a big project would certainly spend a higher percentage of effective working time than they would if assigned to the smaller jobs.

The bigger job, pushed through by larger equipment or big spreads of conventional machines, would be delivered to the highway user months or years faster than has ever been the case before. But contractors cannot purchase and mobilize big equipment expressly for highway work until jobs are let which justify it. Fortunately for highway departments considering really big work, many big contractors have the kind of outsize equipment on hand which is expected to play a part in future road building. They use it for dam construction, railroad construction, mining, and so on.

Interesting Possibilities

If for no other reason than the fact that highway-traffic pressure may soon make it necessary, a job or projects will be let somewhere in the nation soon which will call for the use of more interesting equipment applications than ever before. In some of the massive granite and diorite highway cuts in Arizona, for example, conventional blast-hole drills have already been used. Where will the job be which will make use on a big scale of such efficient drilling equipment as the powerful Joy Heavy Weight Champion, the Ingersoll-Rand Quarrymaster, or the Bucyrus-Erie 42-T? Joy Heavy Weight Champions in an iron-ore mine at Cedar City, Utah, are sinking 100 feet of hole an hour, 7½ inches in diameter. Imagine the power capacity and blasting potential now available and not used in these machines.

Carset drill bits, the kind used conventionally in road building at present, received their first tryout in this same iron mine, many years ago. Who can say that the Joy rigs with their oilwell-type bits will not, some day soon, find a wider application to highway building?

A Case in Point

One of the most interesting jobs to come up in the 1952 working season

If the dirt-work item in a road job were large enough, a contractor might use a rig like this Bucyrus-Erie 200-W walking dragline. Here it is loading a bottom-dump Euclid at Lookout Point Dam in Oregon.

GarWood

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Only Gar Wood offers both hydraulic and cable controlled Tipdozers and Dozecasters, perfectly matched to your Allis-Chalmers tractors. When tractors are used for maximum utility, with both dozer and scraper, Gar Wood's model 281 cable control unit will easily handle either. When used as a dozer only — front mounted model 151 cable control unit is available. Both units have planetary gearing for smooth, easy operation. TIPDOZERS can be adjusted vertically up to 12" at either end of moldboard. Angle of moldboard on DOZECASTERS can be changed to 25" in either direction. SPECIFY a Gar Wood dozer for your new Allis-Chalmers tractor to get more work from your power!

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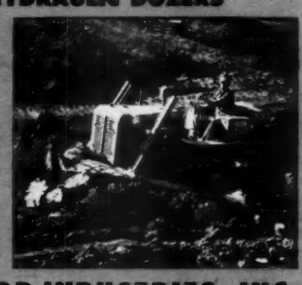

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to prove the point was the Columbia Gorge highway job previously referred to.

For several years, the Oregon State Highway Commission and the Bureau of Public Roads has been busy with a difficult reconstruction job, leading eventually to a rerouting at water level of U. S. 30 between Portland and The Dalles. The old road was built on an alignment considerably more spectacular than safe. It has long since been so obsolete for modern traffic that most through vehicles use Washington State Highway 830, across the Columbia River. The cost-benefit ratio for the new road on the Oregon side was in excess of 3.0, but construction was long delayed.

Big unconventional road-building equipment has played a big part in the successful realignment of this route at water level, thanks to highway engineers who realized this possibility, and to contractors who brought it into being. A preview of things to come started several years ago, when the first massive fills in the Columbia River were built by 30-inch hydraulic-pipeline dredges, in the vicinity of Troutdale. So well did the big rigs build these highway fills that their use was contemplated at several more points upstream.

Several conventional contracts were let, calling for grading, drilling, blasting, fill construction, and so on. Contractors came in with small tractor-scraper spreads, small wagon drills or jackhammers, and shovels down in the 1 and 1½-yard class. The jobs took time. They tied up traffic, and, with no disparagement intended to the contractors and engineers, delayed the day when a new highway could be delivered to motorists who needed it.

Imagine the surprise of Oregon's engineers, therefore, when Guy F. Atkinson Co. moved into what was considered the toughest section of all, a 5-mile rock nightmare near Hood River, and finished it about a year ahead of schedule! What happened still has everyone in the northwest talking, and emphasizes again the fact that big equipment can often speed a job and lower construction costs.

Atkinson's contract called for the maintenance of traffic through most portions of the work. It called for 90-foot fills in the Columbia River: a deadly, deep, swift-running stream which many times had demonstrated its ability to eat away a highway fill as fast as conventional equipment could put it in. The job called for heavy drilling and massive removal of blasted rock. There was a probability at least that the Columbia would hit flood stage at a time when grading was at a peak—an interesting possibility to say the least.

But the Atkinson crews reversed traditional thinking, and refused to consider these things impossible of solution. Instead of moving in with a conventional equipment spread, the company decided to bring in really big equipment with an enormous excavation potential. No shovels smaller than 2½ cubic yards were used at all, and for the first time in that vicinity a 4-yard Bucyrus-Erie 88-B was introduced. Some of Euclid's biggest hauling units were brought in; some so big that torque-converter models were selected to give the best, smoothest application of power in the rough terrain.

Best of all, the equipment had a chance to prove its worth. True to predictions, the Columbia began to rise dangerously. The Columbia River fills had been constructed only to a point about 2 feet above water level to make full use of the 8,000-cubic-yard potential per shift of the equipment fleet. The full excavation potential was thrown into the fight, adding 12-inch layers to the top of the fills. Not only did the material stay in place when it was dumped in enormous quantities, but the topping process quite easily stayed ahead of the rapidly rising Columbia River.

That job was about finished at the end of the 1952 season. Had Atkinson moved in with a conventional equipment fleet, many of the fills would have been washed out, the job would have been delayed at least until the end of 1953, and construction costs to the contractor would have skyrocketed. On the positive side, an entire engineering and inspection force was released to other much-needed work many months ahead of schedule, thanks to a contractor's selection of outsized equipment. From Atkinson's point of view, management and overhead costs were lowered by confining the big excavation job to one season instead of two.

Other cases in point include such jobs as the Oklahoma City-Tulsa toll road (the Turner Turnpike), and other such toll facilities which are being rushed through in big chunks. While no outsized equipment was used on Turner Turnpike, the letting of big contracts helped to encourage the formation of big spreads of conventional equipment. Such big spreads, under the supervision of one experienced project manager, almost invariably make for efficiency.

Hardly any section of the nation could fail to benefit from the use of bigger equipment or larger contracts in its highway work. In most states, projects five times the normal size could often be planned and built at economic advantage.

A quick, imaginative look for such big-contract possibilities in most states will convince the planning engineer and small contractor that such possibilities would place in no great jeopardy the average-sized road job. In most places, sufficiency ratings will still favor the smaller job. Also, no contracting system should be favored which will prevent the start and stifle the growth of small contractors, for from this important nucleus of

(Concluded on next page)

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MATERIAL SPREADERS
FINEGRADERS and HI-WAY WIDENERS

Buckeye Surface Material Spreaders are available in models to give 9′, 10′ and 12′ widths of spread. Materials are spread exactly where wanted — to controlled depths with clean cut edges. No excess material to be raked up later by hand! . . . Flow can be regulated for either uniform or tapered spread — from a mere sprinkle up to 2½″ depth. . . . Width of spread can be narrowed in 6″ multiples.

BUCKEYE POWER FINEGRADERS

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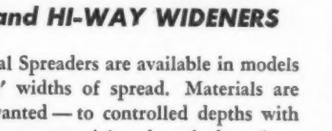
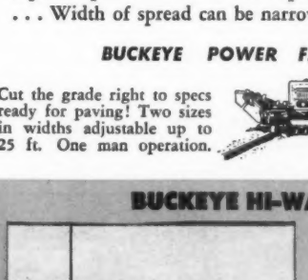


BUCKEYE HI-WAY WIDENERS



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(Above)
Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right)
Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

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PNEUMATIC TIRED WHEEL

IMMEDIATE SHIPMENT

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Sterling WHEELBARROWS

More Highway Miles With Big Machines

(Continued from preceding page)

American free enterprise will come the big contractors of the future.

More dollar investment is represented in America's highway system than in her dams and mines. It is high time that planning engineers consider carefully the economic values of one big project compared to many small ones. It is time that studies be made to visualize where such jobs would be feasible and possible. Having determined this, highway engineers should not be afraid to let a big contract occasionally. The equipment for this big-scale work is available and waiting in the nation's mines, railroad projects, dam building programs, and in the equipment pools of the big contractors.

Chrome-Plated Tape

A new line of chrome-plated steel measuring tapes is announced by Justus Roe & Sons, Inc., Patchogue, N. Y. The chrome plating creates a blue-white background which contrasts with the tape markings and improves their legibility. While the plating provides the whiteness of a soft-painted tape, it gives the advantages of an extremely durable surface. Tapes are available with loop handle or retractable hook handle.

The Redhead tape line comes in knurled-band steel cases covered with leatherette and has flush-folding push-button handles. A translucent plastic carrying case is provided. Lengths range from 25 to 100 feet. Calibrations are in inches and eighths, or in tenths and hundredths of a foot.

For further information write to the company, or use the Request Card at page 18. Circle No. 97.

Steel-Scaffolding Booklet

A new folder showing how a variety of scaffolding is used in construction is available from The Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, L. I., N. Y. Equipment discussed includes sectional steel scaffolds, scaffolding machines, swinging scaffolds, and steel sidewalk bridges. Adjustable steel trestles, scaffold brackets, ladder jacks, and ladders are also shown. The booklet stresses convenience and safety.

To obtain this literature write to the company for Bulletin No. G-206, or use the Request Card at page 18. Circle No. 83.

Lee Rubber in Southwest

Lee Rubber & Tire Corp., Youngstown, Ohio, has opened a new Southwestern District of its Republic Rubber Division. W. T. Willey, former Field Representative in Houston, Texas, is the newly appointed District Manager. His headquarters are in Tulsa, Okla.

Other organization members in Texas are R. J. Cravens in Dallas; D. L. Cushing in Houston; and R. E. McQuiston in Midland.

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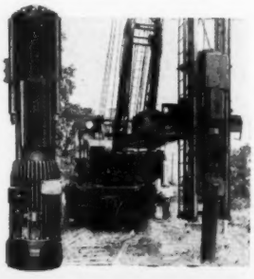

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CARVER has the complete line of self-priming construction dewatering pumps starting with the 1½" Model KN1½L — 4000 gallons per hour — the lightest 4M rated pump on the market.

Every CARVER Contractor Pump . . . right up through the 10" giant which will pump 250,000 gallons per hour — has the same simple design, sturdy construction, rugged durability that means efficient performance on every job. No loose parts, only two wearing parts, easily and economically replaced. All models with gasoline, diesel or electric drive.

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CARVER also manufactures a full line of high-pressure jetting pumps for jetting well points, timber and steel piling, flushing, etc.

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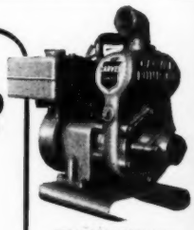

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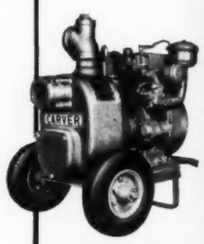

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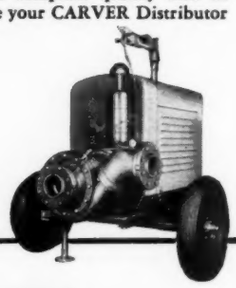

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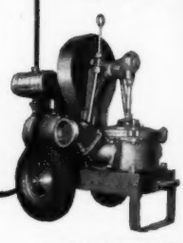

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CARVER PUMPS

Auger-Type Feeder

A new stockpile loading attachment has been developed for the Athey Model 3 Force-Feed loader. The loader for which the attachment is designed is a self-propelled unit that loads windrowed materials such as are found on road maintenance work. The new auger-type feeding attachment is said to deliver up to 10 cubic yards per minute of materials. It is suitable for loading such material as gravel and crushed stone.

The attachment is available either as original equipment on loaders shipped from the factory or as an attachment which can be installed on machines already in the field. It has a moldboard which extends across the loader to provide a 90-inch width of gather and has hydraulic down-pressure on reversible cutting edges.

A new auger-type feeding attachment for the Athey Model 3 Force-Feed loader features a bulldozer-type moldboard.

Of special interest are the sideboards at each end of the moldboard. These may be adjusted for loading from a windrow or a stockpile. When set for stockpile loading the sideboards prevent material from building up in front of the front wheels.

For further information write to Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill., or use the Request Card at page 18. Circle No. 117.

Steel Bridge Flooring

A booklet on steel bridge flooring is offered by Kerlow Steel Flooring Co., 222 Culver Ave., Jersey City 5, N. J. The flooring shown comes in three basic designs, one for long spans, one requiring the use of additional floor beams closely spaced, and a filled-slab type for viaducts, bridges, and roadways.

The booklet has illustrations of typical installations, together with complete specification tables. Steel flooring, drain and trench grates, expansion joints, sidewalks, platforms, and stairways are also shown.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 82.

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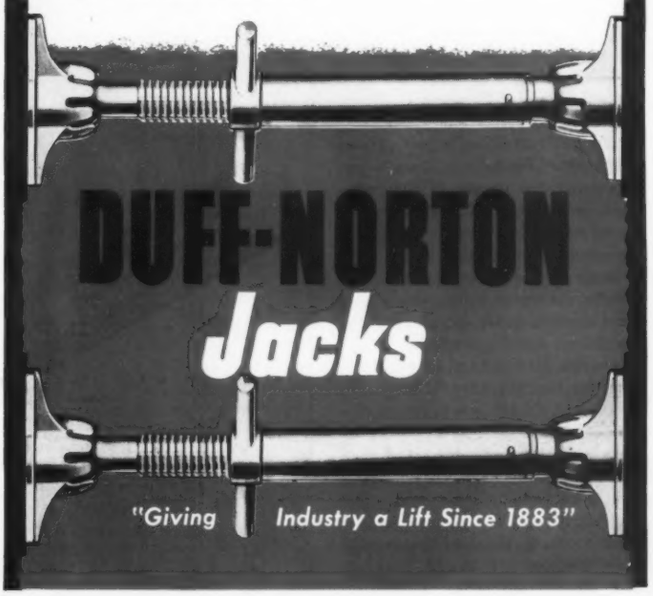

Drought Is Blamed For Paving Cracks

Dry Torrid Weather in Oklahoma Causes Cracking In Bituminous and Concrete Highways

• DURING the past summer the southwest, west, and other sections of the country were gripped by one of the most severe droughts on record. It was particularly severe in the southwest and west, where it had lasted for more than a year.

Oklahoma and many other drought-stricken states found numerous cracks in both bituminous and concrete paving developing during the dry season, even though the paving was only one or two years old, and many people gained the impression from newspaper stories that the cracks were due to poor designing or inferior workmanship, or both.

The Oklahoma State Highway Department and the U. S. Bureau of Public Roads made an exhaustive investigation to learn the cause of these cracks and both came to the conclusion that the long period of dry and torrid weather was responsible.

Distribution of Soil Moisture

S. P. Barnes, Assistant State Materials Engineer, expresses the opinion that construction of a highway all-weather surface course creates a barrier to the normal distribution of soil moisture. This results in design and maintenance problems peculiar to highways alone. Instead of being below the soil mantle it is above it.

Surface courses are usually laid on a comparatively dry firm roadbed. The normal processes of grading expose the top foundation soils to the drying processes of air and sunlight. Also the interim between grade construction and placing of the surface course extends this drying period. And the very size and weight of the principal construction units limit their operation to periods when the subgrade is comparatively stable.

The rates and amounts of moisture change in the soil, below the surface course, after its placement. They vary, generally, with weather conditions and, specifically, with characteristics of the soil. In most 2-lane pavements the center of the pavement, between lanes, is higher than the edges so that water will flow off the pavement to the shoulders. Most of these shoulders are of soil. As soon as the water leaves the waterproof surface it begins to soak into the ground—and laterally under the pavement. How far and how fast will moisture migrate inward, under the pavement? There are several influencing factors, such as (1) the capillary capacity and compacted density of the soil; (2) interference to runoff caused by ruts and other irregularities of the ground surface, grass covering, slope of the ground; and (3) amount of rainfall. We know that lateral capillarity is weak in pure sand soils. It is rapid in sand-silts and silt soils. However, it may not weaken the soil under the pavement for more than 3 feet back from the edge, more often less than 2 feet. Over friable soils of this nature a single crack may develop along the outer edge of the pavement along the plane separating the weakened soil from that which has not absorbed surface moisture. This crack development may be the result of one or a combination of the following circumstances. Moisture absorption causes the soil to swell, thus lifting the pavement, over the affected area, above that not affected. Also the moistened soil is probably weaker than the other, resulting in greater flexing of the pavement over the affected area under traffic loads.

Everyone knows that water swells when it freezes. If a severe cold spell should occur during this moist condition there would be additional swelling due to freezing of the soil moisture. Chill, of course, is due to the temperature of the air above the ground, therefore ice starts to form in or near the top of the soil. Formation of an ice crystal seems to act as a magnetic for nearby water particles. Therefore instead of freezing as dispersed moisture through the soil, these ice formations grow into sheets or lenses between earth layers near the top of the ground. Under severe conditions noticeable "humps" may develop in the riding surface. These are commonly re-

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ferred to as "frost-boils". Although stable while frozen, the top portion of the soil, which the boils have formed, is flooded with water when the ice melts. This so weakens the foundation that failure of the surface is likely to occur under traffic loads.

Dry-Weather Cracks

We started this discussion with a friable soil wherein the line of demarcation between moisture contents of adjacent soil masses is very noticeable as reflected by a single crack. We may have gotten ahead of our story in discussing frost heaves, at this point, because they are more prevalent in more active soils. However, it does serve to further illustrate the point that there may be unequal pressure below the surface course as well as the concentrated pressures of wheel loads from above. As the soil characteristics change from friability to plasticity, this line of demarcation becomes less defined and the number of cracks along the pavement edge increases. Also the width of the affected edge strip is likely to increase. As the subpavement moisture enters from the shoulders so, too, it must leave through them. Therefore, there are two opposing forces at work: rain, tending to feed moisture to the pavement foundations; and sunlight, heat, and low atmospheric humidity, withdrawing it. Except during extended droughts, rain and soil capillarity seem to win as there is more likelihood of an increase in the moisture content of the subgrade. Often noticeable is a rapid deterioration of a pavement that has given 2, 3, or even 5 years of very satisfactory service. This indicates that a period of this length was required for sufficient moisture to accumulate in the subgrade to wet and weaken it.

Drying of pavement subgrades follow the wetting pattern only when the rate of moisture evaporation from the exposed soil does not exceed the rate at which the subgrade soil is capable of feeding the moisture back to the shoulders. In soils where months or even years are required for moisture to migrate from the pavement edge to its center line, it is easy to believe that moisture will be evaporated from the shoulder soil more rapidly than it would be fed back by the pavement subgrade, during the long, hot, dry periods that occur in Oklahoma. When this condition develops, "shrinkage" cracks appear. With this vertical break in the soils mass, the lateral migration of moisture in the pavement subgrade is stopped, therefore shrinkage outside of the crack is likely to proceed at a greater rate, while that inside the crack is retarded. In this way the foundation may shrink down and out leaving the outer extent of the surface course unsupported.

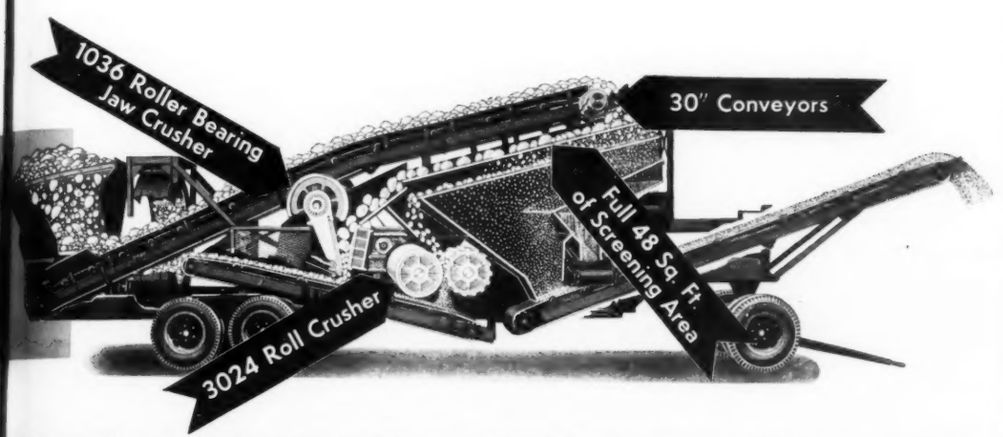
Underground Dew

In many instances, where the surface course was removed, dew has been observed immediately below the surface. In other instances, instead of the dew, a thin film of mud was found. In both instances, the soil or base course had a wet film that did not extend downward through the mass. Through laboratory studies, with a sealed glass cylinder filled with soil, it was learned that moisture migrated to the warm end of the tube in vapor form and that the vapor changed to water when the warm end of the tube was cooled. In nature vapor tends to accumulate in the soil or base course, below a waterproof surface course, when sunlight heats the surface course above that of the subgrade below. When the surface course cools at night the vapor becomes dew. So we realize that both hot and freezing weather tend to accumulate excessive moisture near the top of the subgrade.

Road Cancers

With this understanding of the sensitivity of soil to moisture, one can realize the critical nature of cracks or other breaks in the surface course that will admit surface water. Moisture swelling of soils may vary from 15 per cent in a very friable soil to 70 per cent in plastic soils. Therefore, leakage is likely to develop localized "rough-riding" qualities and eventual failure in an otherwise satisfactory pavement. Although we have the methods and tools to diagnose these weaknesses, many effective cures have yet to be developed and proved. In the heavy-construction industry, more than any other, man must learn to work with nature—not against it. To combat nature is to espouse a lost cause because man's products are constantly exposed to elemental nature's whims.

The medical profession has been able to diagnose cancer for many years. With all the tedious hours, days, and years of research, working back from the result toward the cause, the goal is yet to be reached. Until the cause or causes can be isolated and a simple quick method of diagnosis developed, people will continue to suffer and die from cancer. So, too, with highway construction. Although we can often diagnose road failures, many years of diligent research will be required before many of the potentially cancerous conditions can be effectively treated in the design stage.



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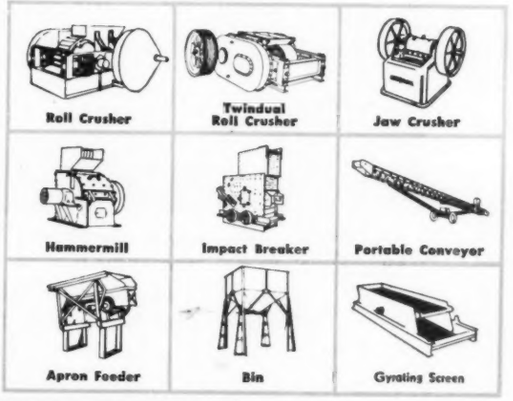


utever your particular crushing, screening, shing, or loading problems might be, Universal ipment invites comparison. For information on complete Universal line at your next opportunity your nearest Universal distributor or write versal Engineering Corporation, 620 C Avenue W., Cedar Rapids, Iowa, a subsidiary of nbone Mulliken Corporation, 00 W. Division Street, Chicago 51, Illinois.

hen you Move, Move Quickly and Easily with Universal rtable Plants . . . And You Move On To Greater Profits

UNIVERSAL GAVE CEDAR RAPIDS ITS ORIGINAL FAME FOR QUALITY CRUSHERS IN CEDAR RAPIDS SINCE 1906

PMCD UNIVERSAL

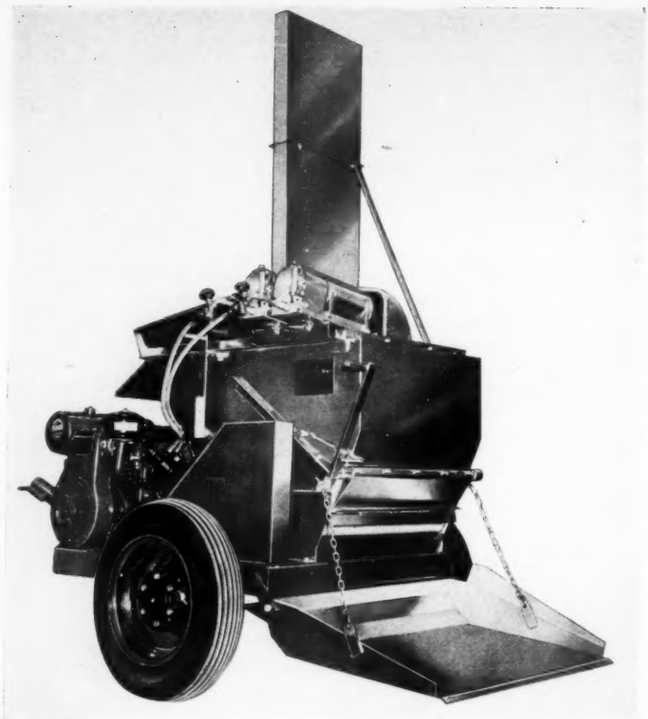
ENGINEERED FOR TOP OPERATING PROFITS

Booklet on Roller Chains

A new bulletin on roller chains and sprockets has just been published by Baldwin-Duckworth Division of Chain Belt Co., Milwaukee 1, Wis. The 54-page book describes the advantages of roller chain, illustrating all the popular sizes of Baldwin-Rex roller chains. A section tells how to select standard roller-chain drives. Formulas, roller-chain dimensions, strengths, weights, and prices are included.

One section of the bulletin deals with stock sprockets, their characteristics, and prices. Bore, keyway, and setscrew information is presented. Proper maintenance of chain drives is reviewed, and information on chain vises, flexible couplings, and coupling covers is provided.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 39.



The HTD-B Multi-Pug asphalt mixer, manufactured by K. E. McConnaughay, Lafayette, Ind.

New Asphalt Mixer

A new asphalt mixer is added to the line of K. E. McConnaughay, 217 N. 6th St., Lafayette, Ind. The HTD-B Multi-Pug asphalt mixer is suited to hot or cold patching operations in any season under wet or dry conditions. It handles mixtures of asphaltic concrete, and sheet, sand or mastic asphalt.

The unit, according to the manufacturer, reactivates and heats stockpile mixtures at a rate of up to 10 tons per hour. It prepares up to 10 tons per hour of cold asphaltic mixtures and up to 5 tons per hour of hot asphaltic mixtures.

The mixer dries various types of wet aggregates and removes moisture and solvents from bituminous mixtures. It processes tars, paving asphalts, cut-back asphalts, and emulsified asphalt.

For further information write to the company, or use the Request Card at page 18. Circle No. 129.

Trailer-Type Road Brooms

A booklet on pull-type road brooms is available from Littleford Bros., Inc., 457 E. Pearl St., Cincinnati 2, Ohio. The units have tricycle-type mounting and come in engine-driven and traction-driven models.

Sprinkler and blower attachments are available for the engine-driven Model 108. The 106 traction model can be supplied with a sprinkler system.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 56.

Line of Motor-Truck Scales

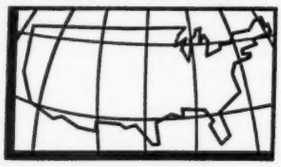
A new folder illustrates and describes the Howe line of four-section straight lever motor-truck scales. Features discussed include ball-bearing platform, inside antifriction plates, and other construction details. Complete specifications and pit dimensions are listed. The scale has a capacity of 50 tons. Platform sizes are 45, 50, or 60 feet long by 10 feet wide.

The folder also describes the company's line of weight indicators offered with these scales.

To obtain this literature write to The Howe Scale Co., Rutland, Vt., and request form No. 678, or use the Request Card at page 18. Circle No. 57.

Need information on equipment? Use Request Card at page 18.

TRANSCONTINENTAL . . .
OR 'ROUND THE WORLD'



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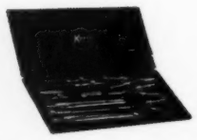

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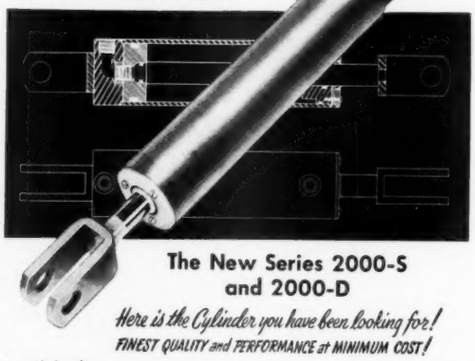

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Here is the Cylinder you have been looking for!
FINEST QUALITY and PERFORMANCE at MINIMUM COST!

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* Single Action
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Whether your primary problem is performance, delivery or price it will pay you to contact BRUNING today.

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DESIGNERS AND MANUFACTURERS OF PRECISION HYDRAULIC EQUIPMENT

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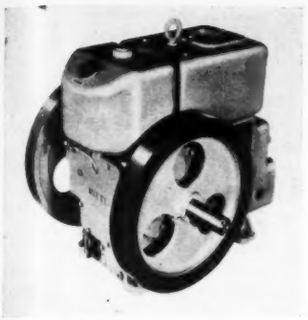
68-CE Beaver Street, New York, N. Y.



The Witte 98 lightweight engine.

Lightweight Engine

A new lightweight, low-horsepower, carburetor-type engine has a starting crank which is built into the flywheel, and which disappears into the flywheel rim when the engine starts.

The Witte 98 is a single-cylinder, horizontal, 4-cycle, water-cooled engine and can be delivered with tank, hopper or condenser cooling systems. It is a square engine with 5-inch bore and 5-inch stroke. It develops from 5 to 10 hp and has a medium speed range from 500 to 1,200 rpm. For continuous 24-hour operation at 1,200 rpm, it is rated at 9.95 hp on gasoline fuel with condenser-cooling system or 10.2 hp with hopper or tank-cooling. Its dimensions are 28 3/16 inches high, 26 1/2 inches wide and 33 7/16 inches long. The engine uses gasoline, kerosene, or gas fuels.

Among recommended applications are machinery, electric generator plants, water pumps, compressors, concrete mixers, and welding sets.

The engine has a removable, wet-cylinder liner and tapered-roller main bearings. An aluminum piston is said to give the engine longer piston and liner life and to reduce the over-all weight of reciprocating parts.

For further information write to the Witte Engine Works, Oil Well Supply Division, United States Steel Corp., 1600 Oakland Ave., Kansas City 26, Mo., or use the Request Card at page 18. Circle No. 119.

Booklet on Tamping Plugs

How to cut stemming time through the use of tamping plugs is described in a new bulletin published by National Mine Service Co., Beckley, W. Va. According to the brochure, Quick-Seal plugs will also save powder, and provide more effective breakage in open pits, quarries, and tunnels.

The plugs are made in two parts, a cylinder of asbestos paper, accordion-crimped and formed into a hollow thick-walled piece held in shape by a glued paper band; and a conical wooden wedge. Sizes range from 1 1/4 to 2 1/4 inches in diameter.

After the explosive charge is placed into the borehole, a plug is inserted into the hole against the charge. The wooden wedge is driven into the expanding part of the plug with a tamping stick. When a ringing sound is heard, the wedge is as tight as it should be and the hole is sealed airtight. The shot is ready to fire.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 85.

Wellpoint Equipment

A booklet on wellpoint equipment for predraining wet excavations is offered by the Moretrench Corp., 90 West St., New York, N. Y. Photographs show dewatering systems on a variety of jobs, including work on a sewer trench, a discharge tunnel, a river-pipeline crossing, a river-diversion channel and a number of other applications. The company points out that when a wellpoint system changes wet ground into dry soil it eliminates "wet costs" such as rubber boots, planks and runways, and reduces sheeting or shoring needed. Work begins with less delay and is completed sooner on dry ground.

The booklet also presents the latest pumps, wellpoints, fittings, and other equipment available. A detailed illustration and accompanying text point to 27 construction features of the company's pumps.

Wellpoint systems may be rented.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 52.

Rodgers Manages Sales

William Rodgers has been named General Sales Manager of Blaw-Knox Co., Pittsburgh, Pa. This is a newly created staff position in which Mr. Rodgers will not only coordinate sales activities for all divisions of the company, but will also assist in developing sales objectives, policies, and programs.

Mr. Rodgers was formerly with McCrady-Rodgers Co., Pittsburgh, where he served as Vice President.

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TOUGH on the Job — LIGHT on the Feet

YOU can concentrate on the job and forget your feet when you slip them into Red Wing's high-stepping Chrome leather Engineer Boots. Proved durability in any weather. Spring Steel Shank. Oak Leather or Composition Sole. Logger or Regular Heel. SEE AT YOUR DEALER'S TODAY.

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meets all specifications for high-type surfaces . . . performs in a manner that satisfies the most exacting engineer.

Austin-Western also makes 3-Wheeled Rollers. Catalogs are yours for the asking.

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BALDWIN LIMA HAMILTON BLH Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

Magnetic Road Sweeper

A new magnetic road sweeper that removes tacks, nails, and other tramp iron from access aisles, highways, parking lots, and airports, has been developed by the Eriez Mfg. Co., Erie, Pa. Called the Super-Sweeper, it can be pushed, pulled, or suspended, and is made in three strengths. It comes in four widths, from 24 to 60 inches. The unit has an Alnico V magnetic element. The tubular steel handle is removable for storage and transportation.

A loop at the end of the handle can be attached to almost any trailer hitch. The wheels are fitted with puncture-proof 8.00 x 2-inch tires. Heavy-duty models are said to operate at speeds up to 10 miles per hour.

The new Super-Sweeper, with easily attachable handles, is said to remove nails and tacks from highways and other areas.

The sweeper has a square aluminum cover, and attached to each side of the magnet's face is a stainless-steel deflector which prevents damage of the face if large objects are encountered. The sweeper is cleaned by turning the magnetic face up with the handle and stripping metal accumulation from the canvas cover.

For further information write to the company, or use the Request Card at page 18. Circle No. 107.

New Curing Sheets

A new concrete curing paper, bleached white on one side to reflect the sun's rays, is said to prevent excessive surface heat during the period of hydration. Sisalkraft sheets are available in widths up to 26½ feet.

According to the manufacturer, under ordinary job conditions and with a 72-hour curing period, the blanket can be re-used a minimum of 15 times.

For further information write to the Sisalkraft Co., 205 W. Wacker Drive, Chicago 6, Ill., or use the Request Card at page 18. Circle No. 1.

Data on Rigid Plastic Pipe

A booklet on rigid plastic pipe is available from the Carlon Products Corp., 10225 Meech Ave., Cleveland 5, Ohio. It contains specific information on the Carlon L pipe's wall protection against burst or collapse, its tensile and flexural strengths, and its chemical resistance. The pipe is said to resist rot, rust, and electrolytic corrosion.

Applications recommended include cross-country piping, lawn-sprinkler systems, land drainage, as well as processing and exhaust lines handling highly corrosive liquids, gases or vapors. Natural gas, oil, and various petroleum derivatives are among substances which can be handled.

Details are given on how sections of the pipe are joined and how they are connected to metal fixtures or established metallic pipelines.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 35.

Three Goodyear Promotions

R. B. Warren, associated with Goodyear since 1927 and former Sales Manager in the south, has become Manager of Industrial Products Departments, The Goodyear Tire & Rubber Co., Akron, Ohio. L. W. Adams, District Manager in Pittsburgh, Pa., succeeds Mr. Warren as southern Sales Manager.

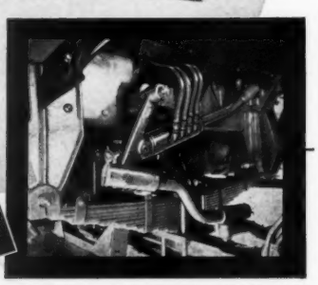
Charles T. White, Jr., has been appointed Pittsburgh District Manager.

Garrison Hydraulic Boosters Make Steering EASY!

"Finger-tip" Control—Under ALL Conditions

Garrison Hydraulic Steering Boosters take the work out of steering! Hydraulic power makes possible "effortless" steering on the heaviest trucks and off-the-road equipment. Even in the roughest terrain, tiring "wheel fight" and "road jolt" are eliminated. Drivers stay fresher; cover more miles per day. Equipment lasts longer; requires less maintenance. Maneuverability is greatly increased, making it easy to get in and out of tight spots. And greater control when a tire blows out or other emergencies arise assures greater operator and equipment safety.

Important news! Garrison Booster Units are now available for International Harvester Series LD 300—LD 400 trucks.



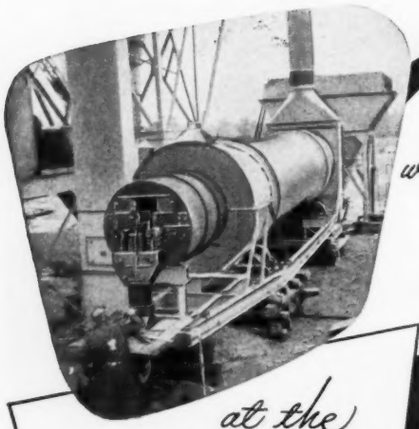
Garrison Booster Unit installed on this LFD 410 I.H. truck supplies power for easy, "finger-tip" turning; absorbs heavy jolts from rough roads.

Put Garrison Power Steering to work for you!

Garrison Hydraulic Steering Boosters are available for most makes and models as factory-approved original equipment. They're also available in kit form for easy installation in the field. Ask your dealer or write direct for full details!

GARRISON Manufacturing Co.

1500 SOUTH SANTA FE AVENUE • LOS ANGELES 21, CALIFORNIA



"Based On Our Experience with **HOPKINS BURNERS** *we've installed Hopkins Units in our 3 other plants"*

If your plant needs an efficient combustion system, consider this message from the Ann Arbor Construction Company. Mr. W. B. Ratliff, Secretary, says—"Our first Hopkins Volcanic Dryer Unit, consisting of three No. 4 Burners, was installed on our No. 4 asphalt plant when it was moved to Roscommon, Michigan, for a 21,000-ton bituminous concrete paving job.

"Based on our experience, using Hopkins Burners on our No. 4 plant, we have installed Hopkins Equipment on each of our three other plants. The four plants have produced over 90,000 tons of bituminous concrete so far this season without any trouble, and without any complaint of moisture in the mix."

You, too, can benefit from Hopkins' efficient, low-cost operation. A letter or phone call will bring you descriptive literature and complete details.

at the **ANN ARBOR CONSTRUCTION** *Company*

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HOPKINS VOLCANIC SPECIALTIES, INC.

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A TRANSPORTING ONE-BAG MIXER

FITS FORD AND FERGUSON TRACTORS

The Universal Transmix mixes, transports and dumps cement, aggregate, water and dirt. Holds 4½ to 5½ cubic feet and mixes one bag of cement, 5 to 1. Can be attached or removed from tractor in 15 minutes.

DUMPS HYDRAULICALLY

Barrel dumps from the hydraulic mechanism on the tractor. Standard 6:00 x 16 tire on barrel is friction driven from power takeoff extension. Barrel revolves on rubber wheels—no gears or chains to wear out.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Nonreference of Labor On Federal Job Excused

THE PROBLEM: *Plaintiff held Federal levee-construction contracts and operated on an open-shop labor basis. Under protest by unions, the Federal Employment Service refused to refer needed labor to the plaintiff. Did the Government thereby render itself liable to the plaintiff on the ground of preventing performance of the contracts?*

THE ANSWER: No. (Ottinger v. United States, 106 Fed. Supp. 198, decided by the United States Court of Claims.)

The employers had agreed with a union to use labor furnished by that union, but refused to put the projects on a closed-shop basis. A strike was later called on account of that refusal.

The gist of the opinion of the Court of Appeals is as follows:

A contractor's refusal to make a closed-shop agreement and consequent picketing shows the existence of a "labor dispute" within the meaning of Federal statutes and regulations, even though no union members were employed by the contractor. A strike by a large majority of the contractor's employees to secure a closed shop also constituted a "labor dispute".

It is not illegal for an employer to yield to a closed-shop demand merely because there has been no election under the National Labor Relations Act and certification of a union as bargaining agent.

There was a "labor dispute", despite any breach by the union of an agreement to waive a closed shop on the contractor's projects if the contractor would use labor hired through the union.

Under the Federal statutes, it would constitute an unfair legal practice for an employer to coerce his nonunion employees into membership in a union, there being no members of that union in his employment. But there was no showing that in Oklahoma, where the projects were to be performed, there was any law against such coercion.

The Court of Claims concluded that "the War Manpower Commission's general policy of refusing to furnish its services as an employment agency to employers who were involved in a labor dispute was not so arbitrary and unreasonable as to render it illegal, and remove it from the category of sovereign acts which do not constitute breaches of implied terms in the contracts of the United States."

Ohio Turnpike Act

A decision by the Ohio Supreme Court, filed July 9, 1952, approved the legality of bonds to be issued for the construction of a turnpike project, payable exclusively from revenues derived under the project. (State ex rel. Ohio Turnpike Commission v. Allen, 107 N. E. 2d 345.)

The court decided, among other things, that expenditures for a study of the project are constitutional; that public credit may be pledged to aid a public organization created for a public purpose, such as the Turnpike Commission; that the bonds do not constitute a debt of the State within a constitutional prohibition; that consent of the governing bodies of municipalities through which a turnpike passes is not essential to the establishment of the turnpike, even as to municipalities operating under home-rule charters; and that the Act properly provides for payment of the cost of relocating intrastate and interstate public-utility facilities.

Wage Scales Differed

THE PROBLEM: *A sewer contractor's bid was based on a recently adopted wage scale. All bids were rejected. The chief engineer orally advised that a new bid be based upon a lower scale previously in effect. This was done and the contract was awarded to the contractor as lowest bidder. After the work had been partly performed, it became necessary to pay higher wages because the contracting authority had awarded other*

(Continued on next page)

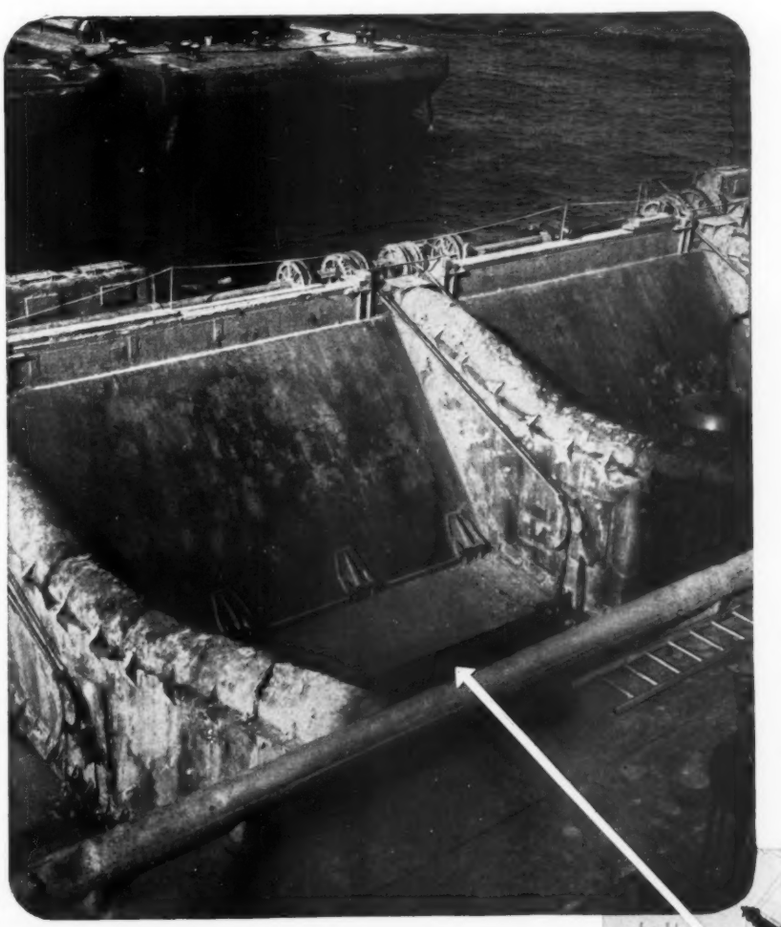
Use Swenson self-feeding material spreaders for fast, easy application of salt, chloride, sand, cinders, gravel or a combination of these materials

Free Information

Swenson Spreader & Mfg. Co.

Lindenwood, Illinois

Eliminating "sore mouth" on a barge— with U. S. Rubber lips



Barge Discharge Doors with bottom edges made of Neoprene rubber.

Black strip on this barge door is the Neoprene rubber edge. Length of edge is 23 feet, the thickness is 5½".

Rock, pipe, cinders and other refuse gave the wooden discharge doors on this barge a hard time ...wearing out their edges. When the doors closed on this hard debris, they often were splintered or broken.

After studying the problem, United States Rubber Company engineers installed rubber edges on the discharge doors. These edges *form around* any hard pieces of material, and then return to shape when the doors are opened. These edges *bend*, instead of wear or break. There is no seepage in or out of doors.

Every day "U. S." engineers come up with some new way to cut maintenance cost and save time and money for industry. These technicians are at your service at any of the 25 "U.S." District Sales Offices. Or write to address below.

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"U. S." Research perfects it...
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Avoid Legal Pitfalls

contracts for similar work based on a higher scale, thus preventing the first contractor from getting necessary labor. Was the contracting authority liable for the extra cost?

THE ANSWER: No. (McKay Engineering & Construction Co. v. Sanitary District of Chicago, 108 N. E. 2d 39, decided by the Illinois Appellate Court, First District, Second Division.)

The court said that the contract was clear as to the wages to be paid, and could not be altered by proof of oral understandings with the chief engineer; and the fact that under agreements made with other contractors the District had allowed for a higher wage scale did not extend the contractor's rights to this case.

MARVEL CONCRETE VIBRATORS

1½ H.P. to 5 H.P.
The standard with contractors for many years.
All stepped-up models now equipped with automatic centrifugal clutch.
Exclusive sales territories open for reliable dealers.
MARVEL EQUIPMENT CORPORATION
215-217 EAGLE STREET BROOKLYN 22, N. Y.

Contractors Break Gas Main

THE PROBLEM: *If street-grading contractors negligently broke a gas main, could they avoid liability to the gas company for resulting loss of gas because of the impossibility of determining the precise loss?*

THE ANSWER: No. (Willmar Gas Co. v. Duininck, 53 N. W. 2d 225, decided by the Minnesota Supreme Court.)

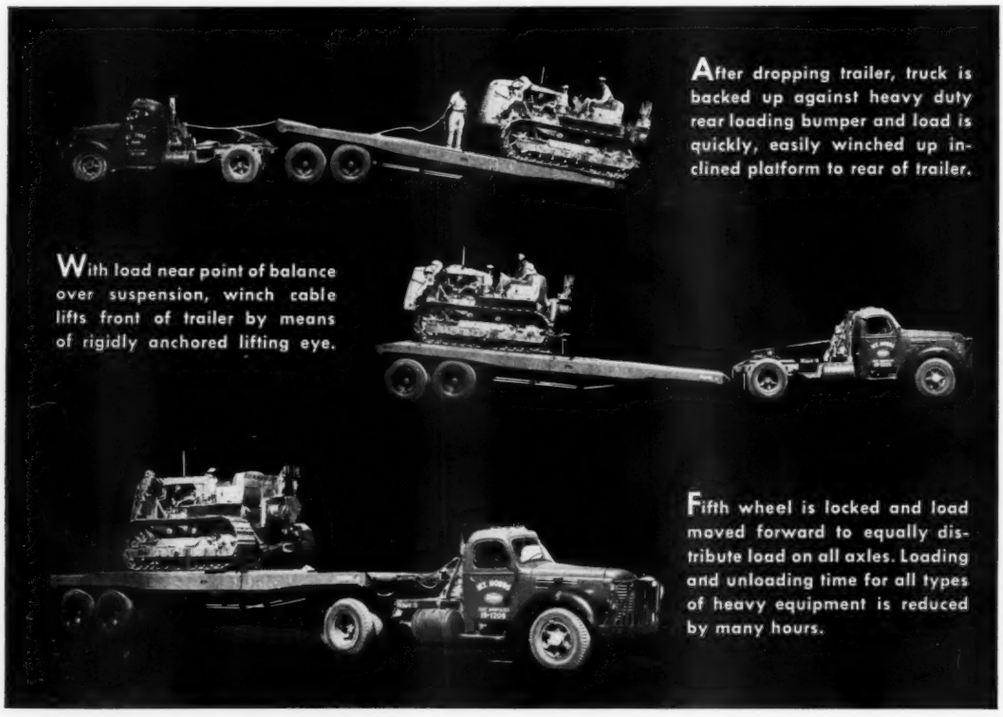
The court said that it was proper to award damages on the basis of an estimate made by a qualified gas expert, who used generally recognized methods for measuring the escaped volume. The opinion cites similar decisions by the Oregon and Michigan Supreme Courts.

for Convenient, Efficient heavy duty hauling . . .

THE NEW DORSEY TRAILERS SELF-LOADING FLOAT

Originally designed to meet the need for speed and ruggedness in the oil fields, the Dorsey Float offers to the construction industry an innovation in transportation. Dorsey Floats are available with load capacity up to 75,000 pounds.

Now heavy equipment can be loaded with ease, and hauled swiftly over highways or rough terrain.



After dropping trailer, truck is backed up against heavy duty rear loading bumper and load is quickly, easily winched up inclined platform to rear of trailer.

With load near point of balance over suspension, winch cable lifts front of trailer by means of rigidly anchored lifting eye.

Fifth wheel is locked and load moved forward to equally distribute load on all axles. Loading and unloading time for all types of heavy equipment is reduced by many hours.

DORSEY OIL FIELD FLOATS are completely equipped, ready for operation when they leave the factory.

SEE YOUR CLASSIFIED DIRECTORY for your nearest Dorsey Distributor — or wire us collect.

DURABLE DEPENDABLE DORSEY TRAILERS
ELBA, ALABAMA

Public Equipment On Private Jobs

THE PROBLEM: *A taxpayer enjoined the use of road-building equipment of his municipality for private purposes. Unless an adequate charge was paid and unless such use was subordinate to and incidental to use of the equipment for public purposes, had he the right to do this?*

THE ANSWER: Yes. (Clapp v. Town of Jaffray, 91 Atl. 2d 464, decided by the New Hampshire Supreme Court.)

But the court said that a municipality has no right to purchase equipment or hire labor beyond its own reasonable needs, in order that it may be used for private purposes.

Specifically, the case dealt with the use of a town bulldozer, grader, trucks, and gravel pit and labor in tarring, sanding, and removing snow from private driveways. This was done under contracts made by the town selectmen and a highway agent with private property owners.

Plaintiffs sued in their capacity as taxpayers, although the suit seems to have been motivated by their operation of equipment which competed with the town equipment. There was no claim on the ground of the competition.

Chief Justice Kenison dissented from the court's decision to the extent that he disapproved any use of public equipment for private purposes, regardless of the fact that the use was merely subordinate to public use and was amply compensated.

Site Delivery Delayed By Dispute: Govt. Liable

THE PROBLEM: *A channel-improvement contract with the Government required that the lands, easements, and rights-of-way necessary for all the work would be provided without cost to the contractor. A levee board acted for the Government in securing rights-of-way and knew that one landowner was resisting condemnation of his land, but the contractor was not so informed. Shortly before the job was completed the owner forcibly obstructed the work until enjoined by court order. Was the contractor entitled to reimbursement for resulting extra expenses?*

THE ANSWER: Yes. (Delta Equipment & Construction Co. v. United States, 104 Fed. Supp. 549.)

The court said that the fact that it was ultimately decided by the courts that the land in question was subject to condemnation did not relieve the Government from liability to the contractor for failing to disclose the fact that right to condemn was in dispute when the contract was made.

Insurer's Liability Covers Arbitrators' Adverse Award

THE PROBLEM: *A subcontract provided that any dispute should be settled by arbitration. The subcontractor procured liability insurance under which the insurer agreed to defend the subcontractor in any "suit" arising out of the contract, and to indemnify him against any judgment. Was the insurer bound to defend the subcontractor in arbitration proceedings and indemnify him against judgment based upon an adverse award?*

THE ANSWER: Yes. (Madawick Contracting Co., Inc., v. Travelers Insurance Co., 114 N. Y. Supp. 2d 300, decided by the New York Supreme Court, Queens County.)

The court reasoned that, although "suit" is commonly thought of as a method of settling a controversy by a judge with or without a jury, an arbitration proceeding should be included, especially since the award is enforceable by court judgment.

Contractor Liable for Flooding Nearby Lands

THE PROBLEM: *Negligent construction of a temporary bridge across a river in connection with a Federal dam job combined with flood conditions to damage nearby lands. Could the contractors escape liability in damages on the ground that they performed work for which the Government could not be held liable?*

THE ANSWER: No. (Stiers v. Mayhall, 248 Pac. 2d 1047, decided by the Oklahoma Supreme Court.)

The temporary bridge consisted of earth fill, with openings sufficient for normal flow of water, but not sufficient to take care of floods.

The court cited a Federal court decision to the effect that a Federal dredging contractor was liable for damage caused by filling a creek with dumped material, while other dumping grounds where no damage would have resulted were available. (Converse v. Portsmouth Cotton Oil Refining Corp. (C. C. A. 4) 281 Fed. 981.)

The court also referred to numerous court precedents to the effect that one who contracts with a public body is not entitled to avail himself of the immunity of the latter from liability from injuries as a result of negligence in the performance of public work.

It was fully recognized that a contractor is not liable for damage caused wholly by an "act of God", but if negligence combines with it to produce injury the negligent one is liable.

Overtime Pay on Government Jobs

THE PROBLEM: *A contract to construct an ordnance plant for the Government provided that the constructor should pay labor at least time and a half wages for overtime. (1) Did the Federal Fair Labor Standards Act apply to the job? (2) If not, could the provision for overtime pay be enforced by the employees on a theory that it was a contract for their direct benefit?*

THE ANSWERS: (1) No. (2) Yes. (H. B. Deal & Co. v. Head, 251 S. W. 2d 1017, decided by the Arkansas Supreme Court.)

(1) The court cited numerous decisions by other courts to sustain its conclusion that construction of the ordnance plant was original construction falling outside the range of interstate commerce, within the meaning of the Federal Act. The court said that interstate commerce was not involved on a theory that the particular plant was one of a series of similar plants in different states, each being a cog in the process of manufacturing ammunition.

(2) The court said that employees were entitled to the specified overtime pay, apart from the Federal statute, under the general rule of law recognized by most courts, "that a third person may enforce a promise made for his benefit, even though he is a stranger both to the contract and the consideration".

Excavating Contractor Was Liable to Neighbor

THE PROBLEM: *An excavation contract provided that the contractor should "protect the owners of adjacent property from injury arising from the carrying out of this contract, and shall make good any such damage and injury." Was an owner of adjacent property entitled to hold the contractor liable under this contract for damage to his property?*

THE ANSWER: Yes. (Vance v. Yonkers Contracting Co., Inc., 113 N. Y. Supp. 2d 733, decided by the New York Supreme Court, Appellate Division, Second Department.)

The court said that the contract between the contractor and the owner was not one that merely indemnified the owner against liability to the neighbors for negligent excavating by the contractor, but was a contract designed to directly benefit the neighbors. And the contractor was liable for breach of the contract to protect the adjacent property, regardless of negligence on his part.

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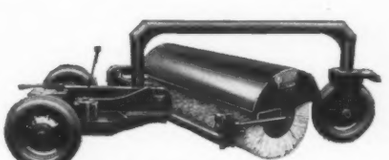
LITTLEFORD

ROAD BROOMS

GIVE ADJUSTABLE BROOM TENSION...

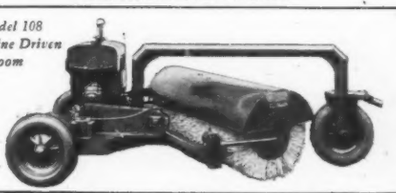
SAVING WEAR ON THE BRUSH... GIVE ECONOMY IN HIGHWAY SWEEPING

When you're putting your money on the line for new Road Equipment, naturally you want the most efficient and economical units available. Where can you get more for your dollar when investing it in a Littleford Road Broom? Here is the only Road Broom with Patented Hydraulic raising and lowering system; this arrangement saves dollar upon dollar in brush replacement. The tension on the brush can easily be adjusted to the road surface which reduces brush wear. This is only one of the many features found on either the Engine Driven or Traction Driven Broom. Remember the LB sign means Littleford Bros. and Lower Budgets for the best in road equipment.



Model 106 Traction Driven Broom

Model 108 Engine Driven Broom



LB LITTLEFORD

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE 1900

LITTLEFORD BROS., INC.

485 E. Pearl St., Cincinnati 2, Ohio

Hydraulic Cylinders

A line of hydraulic cylinders is made by the Bruning Co., 9th & J Sts., Lincoln, Nebr. The company's single and double-action cylinders

are available in 1½ to 3-inch bores. They have standard FEI open-throat clevises on both ends but special clevises or mountings are made on order. The cylinders are stocked with 8 or 10-inch stroke, and other sizes may be had on special order. A heavy-duty ram-type cylinder is also made for excessive shock loads. Bruning stresses that the cylinders require little maintenance.

For further information write to the company, or use the Request Card at page 18. Circle No. 23.

Architectural Porcelain

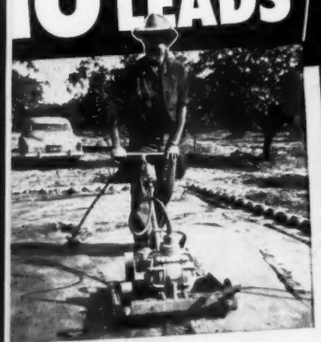
Applications of architectural porcelain are highlighted in the new 12-page illustrated booklet issued by Seaporcel Metals, Inc., 28-20 Borden Ave., Long Island City 1, N. Y.

The booklet describes the characteristics and advantages of architectural porcelain parts and has drawings of 35 construction details utilizing the material. Architectural porcelain metal, it is explained, is essentially a complex inorganic "glass" fused at high temperature to a metal base. It is said to have a finish that is permanent, colorstable, and resistant to acids.

A 4-page section features structural drawings and information on Seaporclad, the new laminated sandwich-type curtain wall and ashlar material with porcelain faces and insulating cores.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 78.

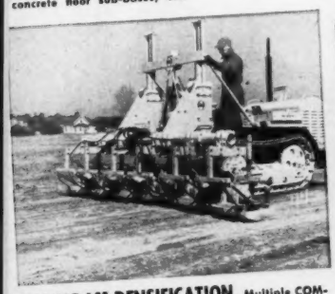
10 LEADS TO BETTER FASTER RESULTS and BIGGER PROFITS!



SOIL COMPACTION. The powerful, new, self-propelling JACKSON COMPACTOR, with 12" to 24" interchangeable bases, achieves specified density of granular soils in 8" to 10" depths at 2400 sq. ft. per hr. Perfect for bridge and pipeline fills, concrete floor sub-bases, etc.

BLACKTOP WIDENING & PATCHING. The same machine, operated from power plant on auto-trailer with pickup for Compactor, is most efficient means of blacktop pavement widening and patchng; paving walks, drives, etc. Compacts 2400 sq. ft. per hr. close to maximum density.

WIDENING STRIP SUB-BASES. Self-propelling tandem COMPACTOR (12" to 24" wide) will provide specified density in one pass. Controlled by spreader operator. No extra labor required.

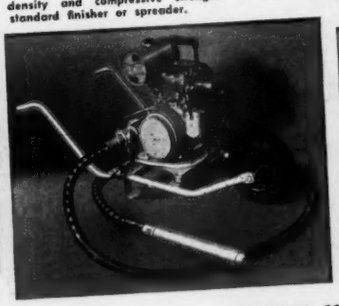


MACADAM DENSIFICATION. Multiple COMPACTOR units, up to 12 ft. wide and tailored to fit job, provide a faster, better means of macadam densification and consolidating sand-gravel-bituminous and other mixed-in-place combinations.

HIGHWAY & AIRPORT PAVING. New, super-powered JACKSON PAVING TUBE gives full width internal vibration through full depth of the slab. Saves time, cement; provides greater density and compressive strength. Attaches to standard finisher or spreader.

SIDE FORM VIBRATION. Works equally well mounted ahead of finisher screed or in rear of spreader. Controlled by finisher operator, it saves better part of two men's labor. Will not snag forms or reinforcements, or penetrate into sub-grade.

MUNICIPAL PAVING. This vibratory Screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around obstructions. Only screed that can be rolled back for second passes on 4 rollers. Most productive and convenient screed made.



GENERAL CONSTRUCTION

(Left): 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right): 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

JACKSON VIBRATORS Inc.

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DUAL CURRENT PORTABLE POWER for operating all JACKSON machines and lights. 2.5 to 7.5 KVA, providing both single and 3-phase 60 Cy. 120 V, AC (120/240 V in larger models). Permanent magnet generators require no adjustment or maintenance.

MASS CONSTRUCTION. The JACKSON VS-4 Vibrator has no rival in economically and efficiently placing mass concrete in dams and similar construction.

Convention Calendar

May 18-22 Material-Handling Show
Fifth National Material Handling Institute Exposition, Convention Hall, Philadelphia, Pa. Exposition Management: Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

May 19-21 Ohio Highway Conference
Meeting, Ohio Highway Engineering Conference, Ohio State University. Prof. Emmett H. Karrer, Brown Hall, Ohio State University, Columbus, Ohio.

May 21-22 Traffic Engineers Institute
Annual Convention, Western Section. Institute of Traffic Engineers, and Sixth Annual Conference, Northwest Traffic Engineers. More Hall, University of Washington, Seattle, Wash. R. G. Hennes, Professor of Civil Engineering, General Chairman, University of Washington, Seattle, Wash.

May 25-28 ASME Conference and Exhibit
Twenty-fifth Annual Conference and Exhibit, Oil and Gas Power Division, American Society of Mechanical Engineers, Hotel Schroeder, Milwaukee, Wis. Wilber W. Young, Publicity Chairman, 29 W. 39th St., New York 18, N. Y.

June 15-19 ASCE Meeting
Summer Meeting, American Society of Civil Engineers, Casablanca Hotel, Miami, Fla. Don P. Reynolds, Asst. to Secy., 33 W. 39th St., New York, N. Y.

June 18-20 Professional Engineers Society
Annual Meeting, National Society of Professional Engineers, Sheraton-Beach Hotel, Daytona Beach, Fla. Kenneth E. Trombley, 1121 15th St. N. W., Washington 5, D. C.

June 22-26 Engineering Education Society
Annual Meeting, American Society for Engineering Education, University of Florida, Gainesville, Fla. Prof. John C. Reed, Chairman, University of Florida.

July 12-15 Association of County Officials
Meeting, National Association of County Officials, Sheraton Plaza, Boston, Mass. Keith L. Seegmiller, Secretary-Treasurer, 1616 Eye St. N. W., Washington 6, D. C.

August 17-21 Shade Tree Conference
National Shade Tree Conference, La Salle Hotel, Chicago, Ill. L. C. Chadwick, Secretary-Treasurer, Department of Horticulture, Ohio State University, Columbus, Ohio.

Foresees Increasing Business Productivity

In an address before Eastern Industrial Advertisers, the Philadelphia Chapter of the National Industrial Advertisers Association, Dean E. Carson, Director of Business Research for The B. F. Goodrich Co., Akron, Ohio, declared that American industry will have to invest about $200 billion by 1960 if our present standard of living is to be maintained. His reasoning was based on results of studies which indicated that by 1960 there would be an increase of 15 per cent in the population of the United States, and that this addition would be mainly to the consuming, not the producing, group.

Mr. Carson was optimistic about the business outlook, and considered the relaxation of controls an encouraging sign. He foresaw broadening markets, increasing employment opportunities, and a steadily rising standard of living.

Tubular-Steel Scaffolding

A folder on tubular-steel scaffolding is available from Hagan Tubular Products, P. O. Box 2272, Youngstown 4, Ohio. According to the manufacturer, the scaffolding can be erected quickly and easily. Photographs show the assembling process.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 128.

New Headache Balls

A line of 62 to 322-pound overhauling weights is made by General Machine & Welding Works, 1100 E. Second St., Pomona, Calif. The Miller "headache balls," as they are known, have a ball-bearing swivel said to provide load control on weight-lifting equipment. The swivels turn freely so that loads do not spin. Twisting forces on the wire rope are also said to be eliminated. Lines last longer and the danger of their breaking is lessened.

The weights come in five sizes ranging from 7 to 13 inches in diameter. All sizes are available with latched hook at additional charge.

For further information write to the company, or use the Request Card at page 18. Circle No. 123.

Crushers and Gravel Plants

Two new equipment bulletins on jaw crushers and on gravel plants have been released by Diamond Iron Works, Inc., 1740 N. Second St., Minneapolis, Minn. Bulletin No. 600 describes the 11 sizes of jaw crushers made by the company. It has cutaway views of the jaw crushers, and charts on capacities, toughness of various kinds of rock, and on the percentage of stone crushed and retained at any crusher setting.

Bulletin No. 1000 gives specifications on the new 100 Series of three portable single-pass gravel plants. The bulletin also highlights the plants' outstanding features and illustrates Model No. 124 portable crushing plant.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 77.

Repairs Conveyor Belts

How to use a plastic type rubber for repairing conveyor belts is told in a folder distributed by Magic Chemical Co., 121 Crescent St., Brockton 2, Mass.

The manufacturer points out that Magic-Vulc can be applied by inexperienced workmen, and without removing the belt from the pulley. No heat or special machinery is required, and the renovated belt is ready for use after only 12 hours of standing. Among other applications the compound can also be used as a coating to protect all types of industrial equipment from corrosion and abrasion.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 46.

Book on Sewerage

"Sewerage and Sewage Treatment," by Harold E. Babbitt, Professor of Sanitary Engineering at the University of Illinois, has been published in a modernized seventh edition by John Wiley & Sons, Inc., 440 4th Ave., New York, N. Y.

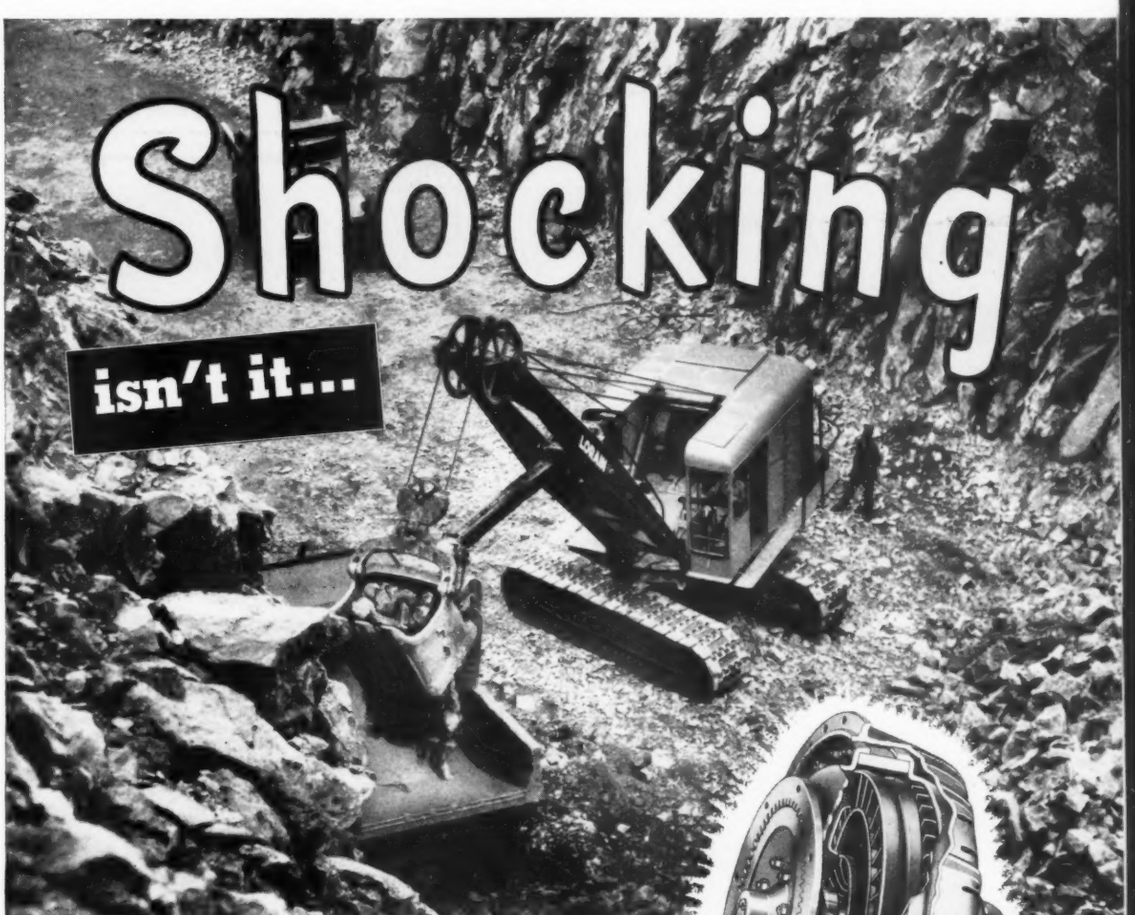
Added features to this volume on design, construction, and maintenance of sewers, are new standard specifications for design published by various state Boards of Health; recommendations presented by a Joint Committee of the Upper Mississippi River Health Engineers and the Great Lakes Board of Public Health Engineers; recent extensive studies on the hydraulics of street inlets; new dimensions of vitrified-clay pipe; information on stresses in flexible rings, arch analysis, and reinforced-concrete sewer design; a new section on internal combustion engines, together with a discussion of 2-fuel engines; and many others.

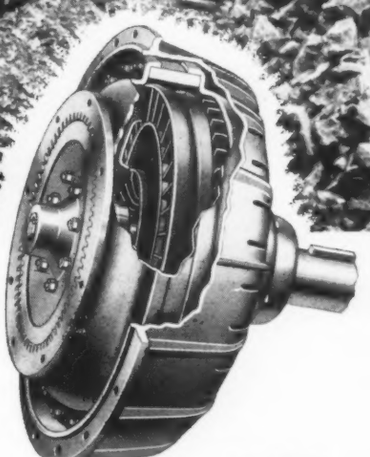
An appendix listing 164 pertinent problems follows the text. The price of the volume is $8.00.

Fairbanks-Morse News

J. A. Cuneo, former General Sales Manager of Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill., has been elected to the Board of Directors. Other appointments in the company include Orren S. Leslie as Vice President in Charge of Manufacturing, and G. J. Malone as Vice President-Controller. The company manufactures a variety of products including Fairbanks-Morse diesel engines, electric motors, machine tools, and contracting equipment.

At elections of the Canadian Fairbanks-Morse Co., Ltd., Montreal, Canada, Robert H. Morse, Jr., was named President and General Manager; George R. Wyer, Executive Vice President; J. E. McQuilkin, Assistant to the President; C. W. Coughlin, Vice President in Charge of Industrial Sales; and H. C. Reindfleisch, Vice President of Consumer Sales.





what tough rock like this *used to do* to a shovel?

If you've ever dug rock, you know what it can do to a shovel. But now, there's no excuse for the shocks and impacts of hard rock digging to wear out or break up a shovel before its time. Back in 1940, Thew-Lorain ended all that with the introduction of the Hydraulic (fluid drive) Coupling on the big 2-yd. Lorain-820. Today, it's still the best way to absorb digging shocks and strains — far more effective than any make-and-break mechanical gadget. Shocks and stresses "melt" away before any damage can be done to mechanism or cables. What's more, you can't stall a Lorain-820 engine, either, under any digging circumstances.

The Lorain Hydraulic Coupling is only *one* big feature that makes the Lorain-820 different and better than any other machine in the 2-yd. class . . . and you get this feature as standard equipment. If rock digging is "shocking" to your equipment and your costs, ask your nearby Thew-Lorain Distributor to tell you the Lorain-820 story — and show you proof on the job.

LORAIN 820

Hydraulic Coupling Is Standard

Demand this feature in your next 2-yd. shovel-crane. Whether your machine must take the "shock of rock" or work on the easiest material handling jobs, you'll get s-m-o-o-t-h-e-r, money-saving performance with the Lorain Hydraulic Coupling. Lorain-820's are available on crawler and rubber-tire mountings.

THE THEW SHOVEL CO., LORAIN, OHIO

THE NAME THAT TAKES THE SHOCK OUT OF ROCK . . .

THEW LORAIN

An Allis-Chalmers HD-9G tractor loads excavated material to a fleet of trucks on the 2-level underground garage job at the north end of Grant Park in Chicago. Speedway Wrecking Co., Chicago, holds the excavating contract for John Griffiths & Son Construction Co., general contractor, also of Chicago.

Truscon Markets Stressteel

Truscon Steel Co., a division of Republic Steel Corp., Youngstown, Ohio, is joining in the promotion of prestressed concrete as a major advance in concrete construction. The company is now promoting and selling Stressteel tensioning bars as an agent of Stressteel Corp., Wilkes-Barre, Pa. Stressteel bars were developed in England and are said to make prestressed - concrete construction competitive with reinforced concrete and structural steel as a basic medium of construction.

In Stressteel construction, the tensioning bars extend through the entire length of the cast-concrete section. They may be secured in position inside the section mold before the section is cast (pre-pour placement), or inserted through core holes in the section after it is poured (post - pour placement). Cores may be of smooth pipe, rubber hose, or inflatable tubing. When used, they are withdrawn from the section after the concrete is poured, thus providing a channel for the insertion of the Stressteel bar. When the concrete is set with the Stressteel bars in position, these are tensioned by hand-operated hydraulic jacks. The bars are anchored at either end of the concrete section.

A patented process for cold-working a special alloy steel throughout its entire length is used for the fabrication of Stressteel bars. A positive-end anchorage sustaining the concentrated high loads imposed on the bars is secured by a specially designed long - tapered thread with a nut of matching thread, which develops 100 per cent of the guaranteed ultimate strength of the bar.

Fifty years ago Truscon Steel Co. pioneered the development of reinforced concrete for construction purposes.

Makes Traffic Signs

A reflective material suitable for highway signs is available from the Grote Mfg. Co., Inc., Grote Square, Bellevue, Kentucky. Grotelite SS (Smooth Surface) has a hard smooth finish on which signs can be made with the silk-screen method, or by painting and spraying. Signs made from this sheeting are bonded to the usual sign-backing material.

For further information write to the company, or use the Request Card at page 18. Circle No. 29.

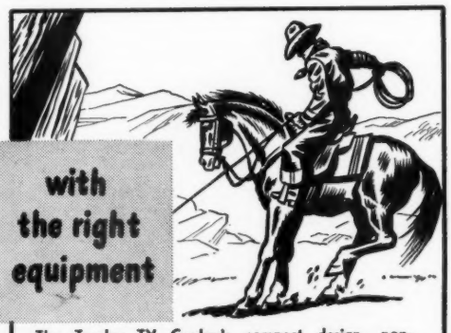
Cutting With Power Saw

Directions on how to cut 30 different materials with a portable power saw are given in a new booklet from the Skil Corp., 5033 Elston Ave., Chicago 30, Ill.

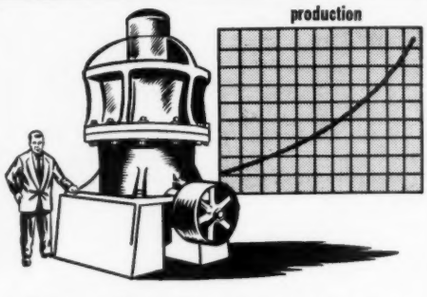
Materials discussed include wood, asbestos cement, copper, aluminum, laminations, sheet iron, tile, and transite.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 9.

Stop run-away costs... with the right equipment

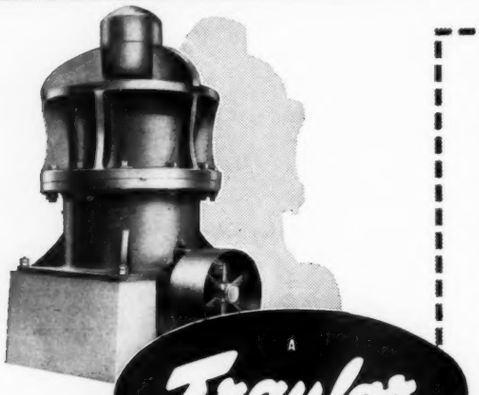


The Traylor TY Crusher's compact design, non-chokable Bell Head, and curved concaves, assure maximum efficiency for producing aggregate on the job.



Compare a Traylor TY's tonnage per horse power. Check its low maintenance costs with any other secondary crusher and you'll agree . . .

There's no need to buck high aggregate costs today. A Traylor TY insures EXTRA profits through increased efficiency.



TRAYLOR TY Reduction Crushers cut aggregate costs 3 ways:

- *Lower Power Costs per ton*
- *Produce a more uniform, cubical product*
- *Reduce Waste Fines to a minimum*

Send me the full story on how a Traylor TY will stop "run-away costs" for me.

Name: _____

Position: _____

Company: _____

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TRAYLOR ENGINEERING & MANUFACTURING CO.
529 MILL ST., ALLENTOWN, PA.
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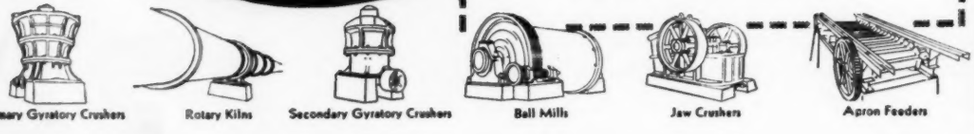

Primary Gyratory Crushers | Rotary Kilns | Secondary Gyratory Crushers | Ball Mills | Jaw Crushers | Apron Feeders

RENT these cost-reducing forms for concrete

Cost records from job after job prove that Economy's system of Form Engineering and Rental Service means substantial savings in TIME—MATERIAL—MONEY for GREATER PROFITS.

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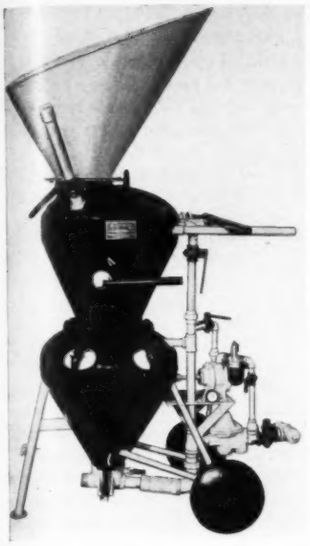
ECONOMY METAL FORMS



Concrete Gun Improved

The latest version of a pneumatic concrete placer has a new slide valve in the loading chamber said to make for easier and faster loading. The new feed-flow control makes it possible to adjust material flow to any desired amount or to cut off material when free air is desired. The air pressure can be controlled to any required degree.

The new Blastcrete gun handles materials with up to 6 per cent moisture, eliminating the necessity of protecting materials against normal atmospheric moisture. It places 1 to 5 cubic yards per hour, or approximately 1¼ cubic yards per hour at 100 cubic feet per minute of air. The gun handles all cementitious materials for construction and all refractory materials, as well as many lightweight aggregates.

For further information write to the Blastcrete Equipment Co., 11154 Santa Monica Blvd., Los Angeles 25, Calif., or use the Request Card at page 18. Circle No. 17.

Pipeline-Laying Equipment

In a new booklet on pipeline laying which demonstrates a variety of equipment in many phases of this work, Allis-Chalmers machinery is shown clearing, cradling, lowering in, and backfilling. The manufacturer stresses that with the company's line of scrapers, motor graders, and tractors, the contractor is offered the equipment versatility that he needs for speed and efficiency. The Model HD-20 tractor with side-boom attachment is featured.

To obtain this literature write to Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 31.

Powered Wheelbarrow

Literature is available on a tricycle-mounted gas-powered barrow that has an interchangeable skip and platform. The Winget-Precision Mechanical Moke has a skip of 4-cubic-foot capacity and an 18-square-foot platform.

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The pneumatic-tired unit is said to run 8 hours on a gallon of fuel.

To obtain this literature write to Precision Equipment, Inc., P. O. Box 168, Danbury, Conn., or use the Request Card at page 18. Circle No. 21.

Structural Laminated Wood

The use of glued laminated wood as structural material is discussed in a new 20-page catalog from Rilco Laminated Products, Inc., First National Bank Bldg., St. Paul 1, Minn. The booklet illustrates basic shapes and shows their application in construction of churches, schools, and commercial and industrial buildings. Basic design data, dimension tables, and connection details are also included.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 41.

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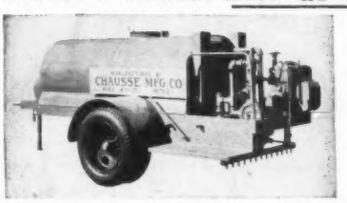

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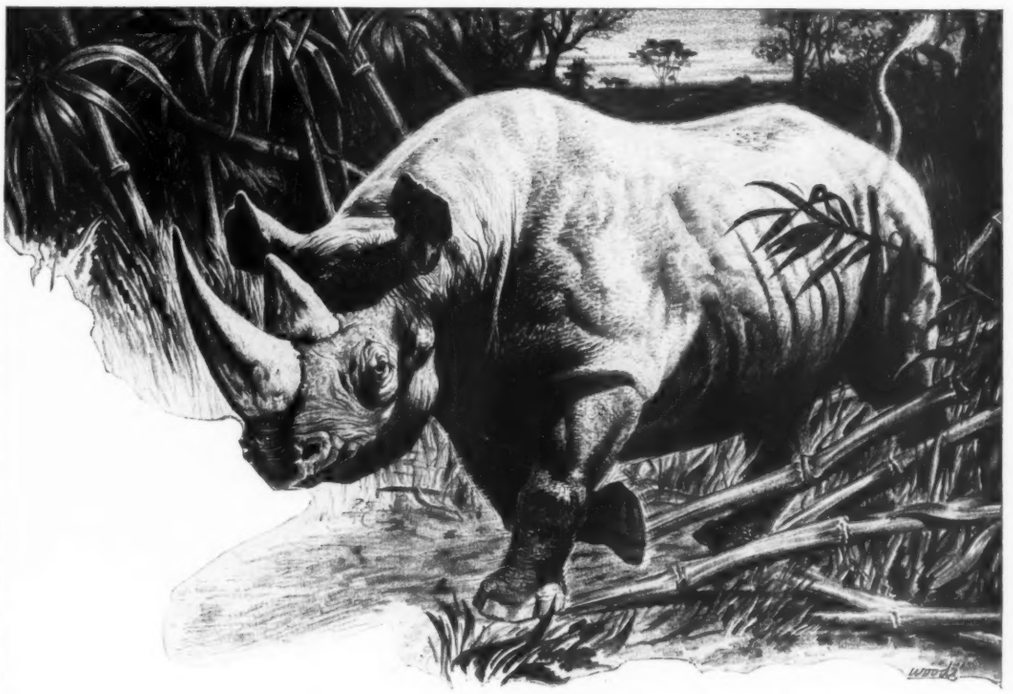

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Building Subways For New York City

Problems of Design and Construction for a 147-Mile "Hole in the Ground" on a Rapid-Transit System

By JAMES H. GRIFFIN, Chief Engineer
Board of Transportation, City of New York

(Part One of a Two-Part Article from a Paper Given by Mr. Griffin at a Recent Metropolitan Section Meeting of the American Society of Civil Engineers)

The complete New York City Rapid Transit System is 809 miles long, almost as far as it is from New York to Charleston, S. C. Of this total, 572 miles are surface lines while the remaining 237 miles are elevated or subway. Only 90 miles of elevated lines are left, with 147 miles of subways accounting for the remainder of the system. The initial section of subway is nearly half a century old.

On July 1, 1949 the original nickel fare was boosted to a dime. Now, in order to run the lines at a fare sufficiently high to cover operating expenses, it appears that the municipal subway, elevated, bus, and street car system will be turned over to a Transit Authority, created by the 1953 state legislature. While the 10-cent ride seems doomed, the revenue obtained from a fare increase would probably result in new lines, extensions to existing lines, and badly needed capital improvements.

• A SHORT time ago, there was a show on Broadway called "On the Town". The lyrics of one of its hit tunes ran as follows:

"New York, New York, is a helluva town,
The Bronx is up, but the Battery's down,
And the people ride in a hole in the ground—"

This "hole in the ground" is the subject of the present article.

The New York City Transit System is city-owned and operated by the Board of Transportation pursuant to the Rapid Transit Law originally enacted in 1891, subsequently amended and supplemented, and now consolidated as Chapter 800 of the Laws of 1941. It comprises all subway and elevated rapid-transit lines in the city, as well as the remaining trolley lines, trolley-coach lines and many of the bus lines that are city-owned. For those who like statistics, the complete transit system comprises 572.18 route miles of surface lines, 236.59 route miles of rapid-transit lines, including those on viaduct for their entire length such as the Third Avenue El in Manhattan and those partly on viaduct and partly in subway. Of these rapid-transit lines 133.28 route miles are subways or tunnels under city streets, and 14.00 route miles are subaqueous tunnels under the rivers surrounding Manhattan.

The system was once composed partly of city-built and city-operated lines, and partly of city-built and privately operated lines. These were unified in 1940 when the City of New York purchased the IRT and BMT Systems. These two systems, when combined with the City-owned Independent System (so-called) resulted in the New York City Transit System as we now know it. Thus we now have the IRT, BMT, and IND Divisions. The city is also in the freight business in a small way, having likewise acquired the South Brooklyn Railroad, a 6½-mile freight line in Brooklyn.

From the opening of the first subway 49 years ago, Rapid Transit traffic steadily increased in volume until, at its peak in 1948, an average of 6,638,000 rides was reached in an average weekday on 13,292 regularly scheduled trains. Although annual figures are now somewhat below those of 1948, rush-hour traffic has not decreased in any substantial way. During the morning and evening rush-hours, the system carries more than 50 per cent of its traffic load. Obviously, therefore, peak loads are the ones for which the system must be designed.

Design

Once the route of a subway has been established as provided by the Rapid Transit Law, the first step in design is the determination of alignment and grades. Curvatures are kept as flat as practicable for obvious reasons. On the first subway, which was designed for 51-foot cars, the sharpest curve has a radius of 147 feet and another a radius of 191 feet. The present design minimum for the

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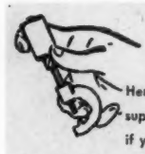

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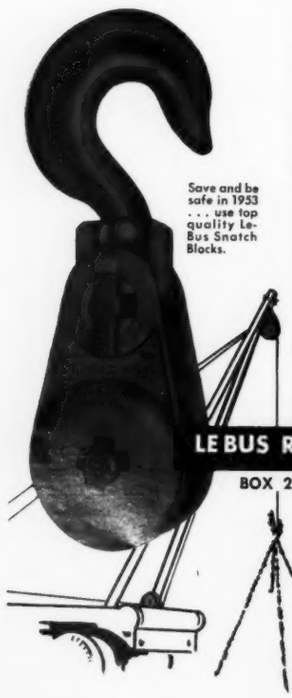

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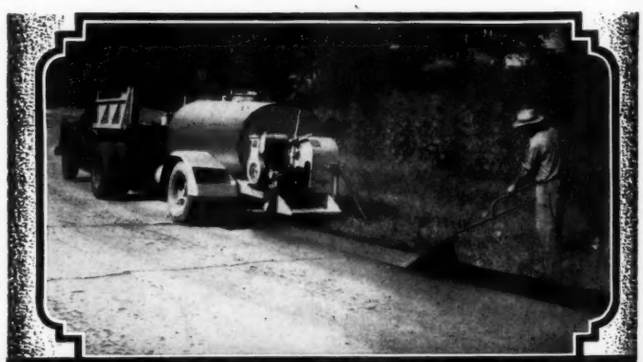

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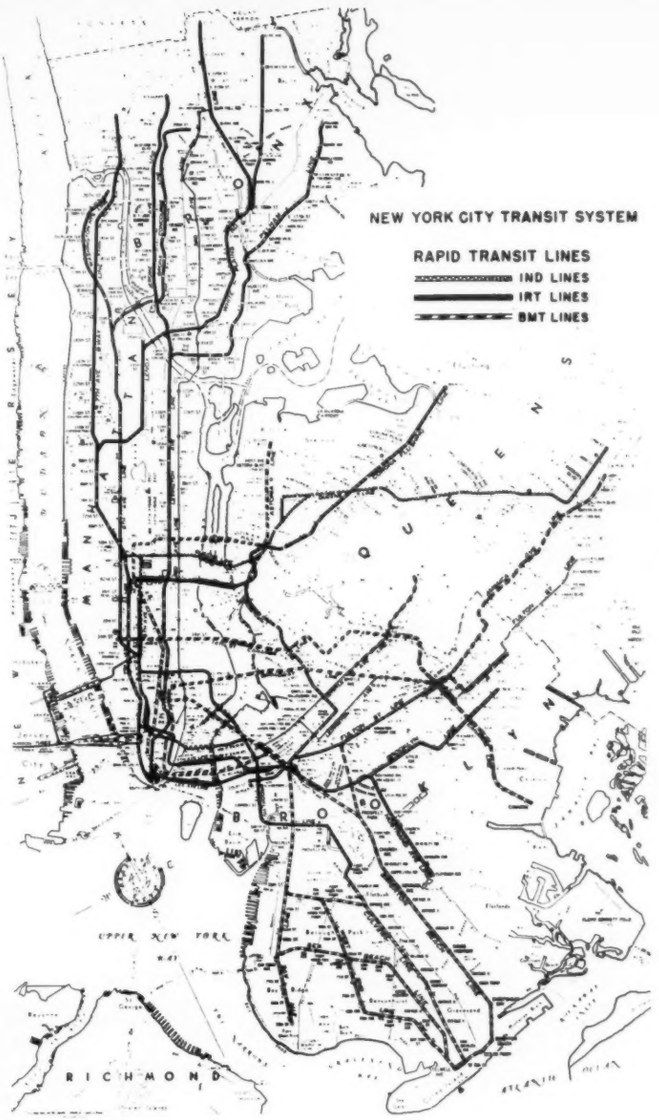
60-foot car is 350 feet. Where curves through stations are unavoidable, an effort is made to give them at least a 3,000-foot radius. This produces a 1-inch additional gap between the train platform and car body due to track curvature.

Superelevation on curves is designed for speeds of 30 mph for local service and 40 mph for express service, with a maximum superelevation of 6½ inches. In subways, superelevation is accomplished by raising the outer rail and lowering the inner rail by an equal amount so as to reduce encroachment on the headroom.

Grades on tangent track are kept within 3 per cent where possible, although a few grades on the older lines at bridge and tunnel approaches run as high as 5.2 per cent for short distances. An effort is made to approach stations on the upgrade and leave on the downgrade in order to assist braking and acceleration. The grade of tracks through stations is made zero where possible, and must not exceed 1 per cent.

Tracks are kept as near as possible to the street surface to minimize excavation (in open cut) and reduce vertical movement of passengers. The distance is limited, however, by the necessity of providing several feet of cover over the roof of the subway to allow for large water mains and other utilities in the streets. Longitudinal sewers are usually reconstructed outside the side walls of the subway, and sewers crossing the structure where there is shallow cover are carried underneath the structure in inverted siphons.

The IRT subway—the oldest of the three divisions—was designed for a car 9 feet wide and 51 feet long. The designers of the BMT system, however, decided upon a much larger subway car 10 feet wide and 67 feet long. The later IND follows the dimensions of the BMT and all IND cars are standardized at 10 x 60 feet. Consequently, all IRT subways have smaller dimensions



than either BMT or IND, making it impossible, unfortunately, to interchange IRT car equipment with that of the other divisions.

The tracks are spaced 13 feet 6 inches for the 10-foot-wide cars, and the clear inside height of the structure above the base of the rail is 13 feet 2 inches, which allows about 6 inches above car height for jacking up cars in case of derailment. The spacing of the tracks allows sufficient width for signal apparatus and for the safety of maintenance crews standing between tracks while trains are passing. Depending on the distance of the tracks below the surface and the geology along the route, the structural cross section may be rectangular, horseshoe-shaped, or circular. In ordinary trench construction, the cross section will be rectangular. If in tunnel, as in deep earth, rock with 10 feet of cover, or subaqueous, the cross section will be either horseshoe-shaped or circular.

The usual rectangular type of structure consists of simple riveted steel bents, normally spaced 5 feet on centers, with concrete arches between them. This uniform spacing makes possible repeated use of concrete forms. For future subway design, studies have been made of steel-bent construction using welded or riveted rigid frames and also using welded simple frames, with the following conclusions: Welded rigid-frame construction would save an estimated 15 per cent in steel tonnage over the articulated (simple) riveted design, but this would be more than offset by increased labor costs. Welded simple-frame construction would save an estimated 2 per cent in steel tonnage over riveted construction and up to an estimated 20 per cent in labor costs. However, the supply and quality of welders available locally for field welding might well determine the use of welded over riveted construction.

Consideration has also been given to the use of a reinforced-concrete design. Some years ago, such a design was built into a section of the Fourth Avenue subway in Brooklyn. However, due to the presence of large amounts of temporary timber bracing prevalent in the subway cuts in those days, the design was not continued.

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(Continued on next page)

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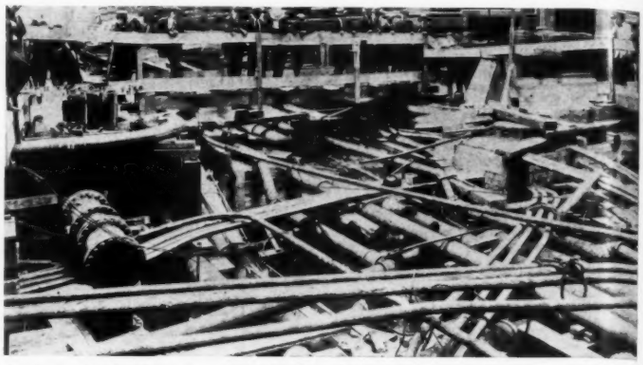
Building Subways For New York City

(Continued from preceding page)

a clean cut, together with the steel shortage, a reinforced-concrete design has been adopted for future construction as an alternate to the steel-bent design. Estimates show that, while there should be a saving up to 30 per cent in a steel tonnage, the cost of the steel-bent and reinforced-concrete structures will be about the same.

Load and Stress

The assumed design loading for subway structures may be of interest. The roof of the rectangular section is designed for a superimposed load of 600 psf on sidewalks and roadways. While this may appear high, experience has shown that a live loading of this magnitude is necessary in order not to restrict the use of the streets. In the late war, a big naval gun weighing 90 tons was moved from the Navy Yard to 48th Street and Fifth Avenue, Manhattan, passing over the subway system ten times en route. There are many such examples of especially heavy loads being moved over the city streets. Where subway structures are to be affected, the loading must first be investigated by the Board's engineers, and if necessary, restrictions placed upon the route to be followed.



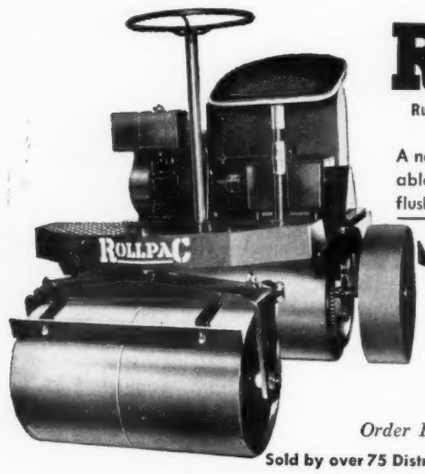
A picture that has become a classic in illustrating some of the problems of subway construction. This maze of underground facilities was encountered at the intersection of Wall and Williams Streets in 1917.

As an alternate to the live load of 600 pounds on the surface, a local concentration is assumed equal to 200 kips on four wheels, spaced 12 feet between axles and with a 6-foot gage. The wheel concentrations are considered as distributed over an area 2 feet x 2 feet on the pavement and thence through the earth above the subway roof at a slope of 1 to 2. The minimum load that the roof is assumed to carry is 1,500 psf, which is equivalent to that imposed by live and dead loads at a depth of 9 feet below the surface.

When a subway is constructed through earth saturated with ground water, the design must take care of water pressure in addition to the earth load. Thus the floor or invert is designed to distribute uniformly over its entire area a load equal to that carried by the roof. This is done to minimize settlement, and consequent leaks, and to take care of any upward pressure on the invert.

The side walls of the structure must have sufficient strength in bending to take care of side pressure of earth and water plus sufficient strength in compression to support the load received from the roof. Thus the steel side-wall columns are designed to take the bending stresses while the concrete sidewall arches in which they are embedded take care of most of the load from the roof beams by adhesion between the steel columns and concrete arches.

In rock sections, roof and side walls are designed as in earth sections, except that no side pressure is assumed from the rock itself, unless it is badly disintegrated, and water pressure against the side wall is assumed at one-half the pressure resulting from the height of water, since the sides of the structure are concreted against the adjoining rock, thus producing a seal. The invert in a rock section is now poured to a thickness of 6 inches to cover irregularities in the rock floor below, since no strength is required in bending. Upward water pressure is relieved by weep holes in the invert. The small flow of water entering the subway through these



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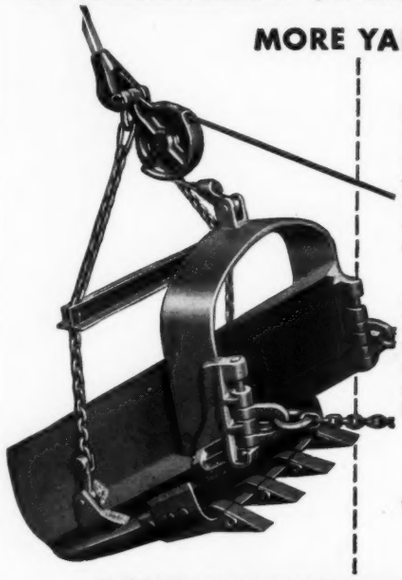

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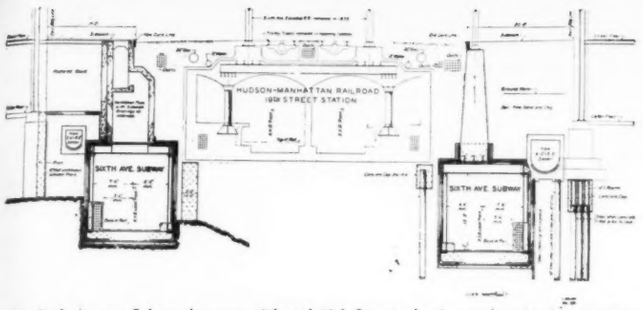

The Sixth Avenue Subway between 18th and 19th Streets showing its location in relation to the underground Hudson-Manhattan Railroad.

weep holes is taken care of by the drainage system.

In concrete-lined land tunnels built in good rock, no pressure is assumed to be exerted by the rock in place. However, on the assumption that there might be a spalling or loosening of the rock above the roof of tunnels two or more tracks wide, the weight of a 10-foot height of rock is assumed to rest on top of the tunnel lining. This also takes care of any hydraulic pressure that might be present. In very poor rock, the tunnel lining is thickened and reinforced, or a different type of section is used to meet local conditions. The deepest land tunnel in the subway is in St. Nicholas Avenue, near 191st Street, Manhattan, where the base of rail of the IRT tunnel is 181 feet below the street surface.

In the design of cast-iron-lined subaqueous tunnels constructed with the use of a shield, allowance must be made both for permanent stresses and the temporary stresses which occur during construction. The construction period is therefore the most critical since the tunnel rings are then subjected to maximum stresses due to superimposed loads and weight of rings plus reaction from the shield jacks. To overcome the tendency of the tunnel during construction to flatten vertically and bulge horizontally, vertical struts or tie rods are placed in the rings immediately behind the shield; these are removed after the voids outside the rings are packed and grouted so that full lateral reaction pressures are developed.

The soil surrounding the tunnel subjects the rings to various pressures. On the upper half of the ring there is downward pressure of an intensity at any point equal to the column of water and saturated earth imposed at that point. On the lower half of the ring there is an upward resisting pressure uniformly distributed equal to the downward pressure diminished by buoyancy. The intensity of the horizontal pressure on the vertical half-ring is equal to that due to hydraulic pressure plus active earth pressure and its passive resistance (i.e., horizontal resistance to disturbance).

When the hydraulic pressure at the invert is greater than that at the crown due to the difference in heads, the tunnel will tend to rise. This tendency must be overcome by depositing a volume of riprap over the tunnel to create a permanent blanket.

To prevent an inflow of water, compressed air is injected into the tunnel under a pressure above normal equal to the hydrostatic head at or near the invert.

The design of the ring segments is based partly on theory and partly on precedent. It is rather an involved design, not suitable for inclusion in this article. This also applies to the bolts which connect the segments to each other and to the adjacent rings. High-tensile steel-forged bolts are used to connect the ma-

(Continued on next page)

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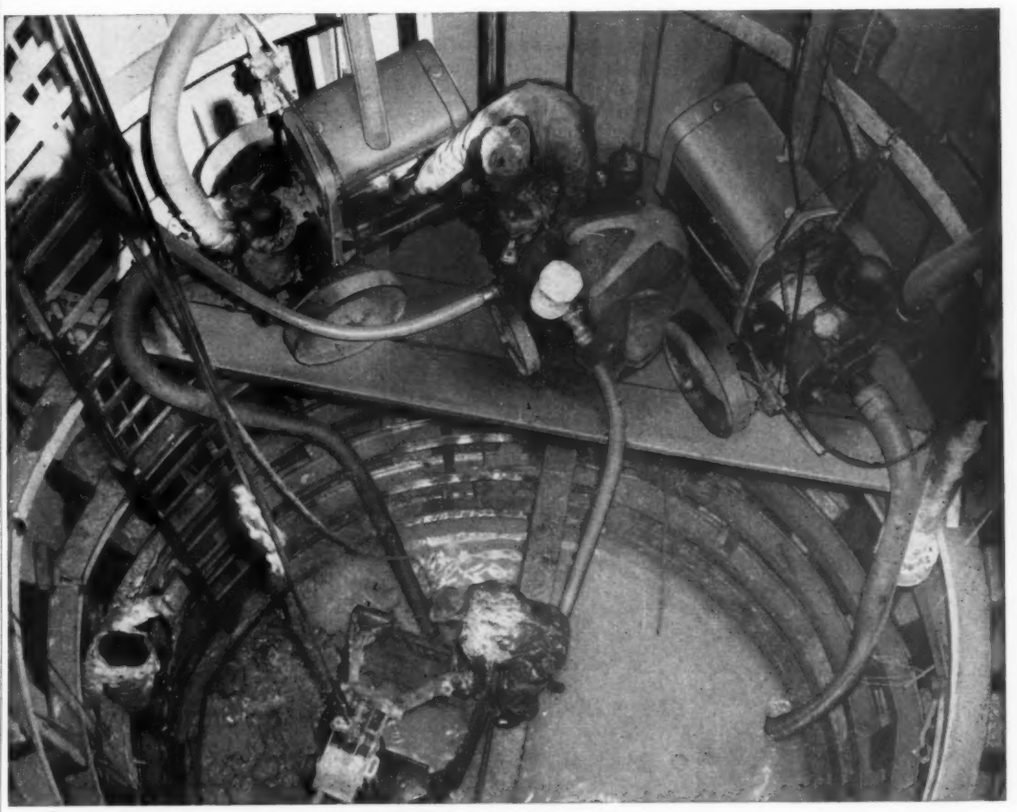

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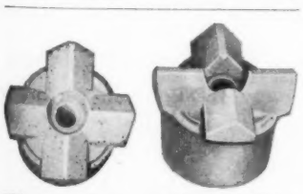

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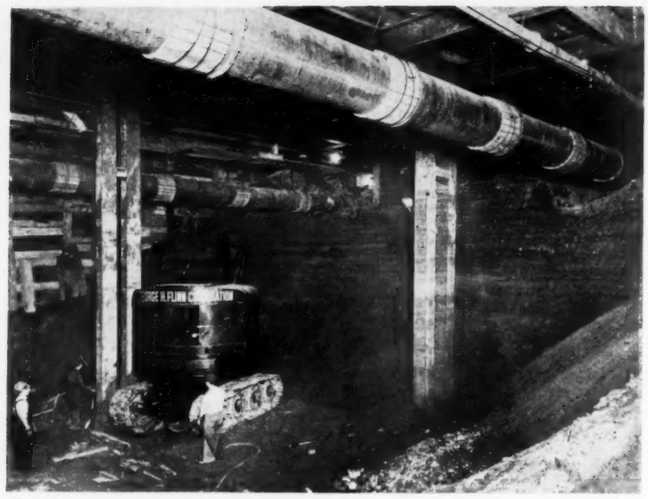

Shovel excavating at a heading. Underground pipes and utility lines are temporarily hung from the overhead framework.

gate to be used is determined in advance in accordance with predetermined unit weights of the fine and coarse aggregates actually used. Water in measured quantity is added at the job site. Design strength in bending is now based conservatively on a compressive strength of 2,500 psi. Strength and uniformity obtained from the Board's specifications are about the same as those obtained when controlled-concrete specifications are strictly followed.

Inspection

Inspection and testing of the materials used in subway construction and equipment and in subway maintenance is handled by the engineering force of the Board which maintains a general testing laboratory at Carroll Street and Franklin Avenue, Brooklyn. The Board also undertakes to inspect and test materials at the request of city departments. Much of the inspection and testing is in connection with the great variety of equipment and materials used in operating a subway, from car wheels to cleaning detergents. During the year 1951—a year of comparatively small construction volume—the value of materials inspected and accepted amounted to about $9,250,000, including iron and steel and other metal products, fuel oil for heating power plants and shops, gasoline, diesel oil and lubricating oils, cement, lumber, paints, waterproofing, and miscellaneous construction materials. During this period, materials having a value of about $7,000,000 were also inspected and tested for city departments.

Construction materials are inspected, where practicable, at the

Building Subways For New York City

(Continued from preceding page)

chined flange faces of the segments.

To help secure watertightness, bolts are tensioned to 25,000 psi. Leakage around bolts is prevented by applying hemp grommets, impregnated with red-lead paste in linseed oil, under the washers at the head and nut of each bolt. The caulking recesses cast into the lining segments along the edges of flanges are filled with metallic lead and then pointed with one-to-one portland-cement grout.

The tunnels are afterward lined with concrete to protect the rings and bolts, and they are then ready for installation of track and equipment.

Specifications

Concrete specifications call for a normal mix of 1:2:4 by volume with the fine and coarse aggregate measured by weight. Concrete is batched at commercial central-mixing plants and the actual weight of the aggre-

it uses its HEAD to LOWER YOUR COSTS!

VIBRO-PLUS ROLLGEAR* internal vibrator

With the patented Rollgear, Vibro-Plus steps up 3600 RPM shaft speed to 11,000 to 15,000 VPM at the head. It accomplishes this high speed without belts, gears or clutches.

Because it vibrates at this super-speed, Vibro-Plus compacts concrete more rapidly, more effectively — which saves money.

Because design is so simple and shaft speed so low, parts wear longer, down-time is shorter, maintenance is less — which saves still more money. Write for bulletin and nearest distributor.

TYPE PRSB is pnematically operated, for use when electric or gasoline power are impractical—but shaft and head can be used with these power sources. Comes with 20 or 30 ft. flexible shaft. 1¾"—2-3/16"—2¾" and 4" diameter heads (which never need lubrication). Grinding attachments available.

OUR ENGINEERING DEPT. *will recommend, design and build special equipment for any special purpose.*

*Reg. U. S. Pat. Off.

VIBRO-PLUS PRODUCTS, INC.

54-11 QUEENS BLVD., WOODSIDE, 77, N. Y.

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WORLD'S *Lowest Cost* PERSONNEL TRANSPORT AND ALL WEATHER MATERIAL CARRIER!!

UTILITOP FOR ½, ¾ AND 1½ TON TRUCKS

Utilitop doubles usefulness of your pick-up or ¾ ton truck. Designed to fit like a glove. Heavy-duty lock zippers give all-weather protection. Clear plastic front and rear windows will not crack. Top and sides are heavy-duty duck vinyl plastic coated, both sides. Three colors: Stratablue, Gray, Olive Drab. Fits all ½ ton trucks. Specify make of truck when ordering for ¾ ton truck.

Price F.O.B. Fairburn, Georgia, if sent C. O. D. We pay freight if check accompanies order.

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DIRECT FROM FACTORY TO YOU $65.50 ORDER NOW AND SAVE $23.50

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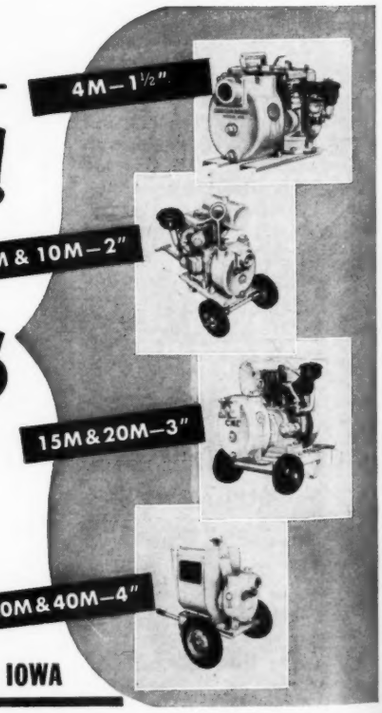
FAIRBURN ★ GEORGIA

GET FAST DUAL PRIMING— DEPENDABLE LONG LIFE OPERATION— and KING SIZE in VALUE!

MC DUAL PRIMERS



Completely New Dual Prime Pump Line Featuring

- Faster Dual Volute Priming
- Self Cleaning Case
- Lighter Weight—Easier to Move
- Oilless—Greaseless—Long Life Seal
- Half the Parts—Easier to Service
- Unitized Construction—Trouble Free Operation

CONSTRUCTION MACHINERY COMPANY • WATERLOO, IOWA

source of manufacture to eliminate waste and avoid delay and expense in replacement of rejects. For instance, pine lumber is inspected at the mills and lumber yards in the south where it is being produced. Cement testing is done in the Board's laboratory located in the Pennsylvania cement district where samples taken directly from sealed bins at the cement plants are tested and chemically analyzed, thus saving time and expense in shipment of samples.

Field inspection at the job site is the responsibility of the Resident or Section Engineers. For many years, job-site inspection was done exclusively by men with knowledge of the trade involved. In recent years, however, junior engineers who exhibit proper aptitudes have been successfully employed as job-site inspectors.

(To be concluded next month)

Industrial Cleaner Sprays On, Wipes Off

A new industrial cleaner that is applied by a hand-sized pressure spray gun is made by Kelite Products, 1250 N. Main St., Los Angeles 12, Calif. It removes grease, oil, wax, gums, dirt, dye, ink, cutting soap, and light carbon from metals, plastics, rubber, porcelain, composition, concrete or wood. Spray White is said to clean without heat, odor, fumes, solvents, fire hazard or danger to skin.

The spray gun is charged with air pressure from any source, can be refilled, and holds enough cleaner for several hours of average cleaning.

For further information write to the company for Bulletin 126, or use the Request Card at page 18. Circle No. 98.

Consulting Engineers Form Prestressed-Designing Firm

Preload Engineers, Inc., is a new company formed out of Preload Co., Inc.—pioneer in prestressing in North America. It has opened offices at 955 N. Monroe St., Arlington, Va.

This firm of consulting engineers was established to provide an organization solely concerned with the design of prestressed structures such as buildings, bridges, tanks, pipelines, and pavements. The company will advise its clients on the practicability and availability of various materials used for prestressing, as well as make use in its designs of those prestressing methods best adapted to specific problems. Services offered by Preload Engineers, Inc., include preliminary inspection and reports; preparation of plans for construction; estimates of quantities and costs; analysis of bids and assistance in letting contracts; inspection, consultation, and advice during construction.

New Pressure Switch On Engine Hour Meter

An improvement in a pressure switch used in its engine hour meters is announced by John W. Hobbs Corp., 226 Yale Blvd., Springfield, Ill. Heavier materials are being used for the terminals, and the operating diaphragm is now assembled without solder. The use of solder in the final assembly is also eliminated and oil leakage is said to be impossible.

Equalizing the pressure in the inside upper chamber with that on the outside of the switch has increased the ability of the new switch to withstand the action of heat and cold, according to the manufacturer. Old switches now in use can be replaced since the new ones are the same size.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 49.

Shoulder Maintainer

A shoulder maintainer is described in literature from the Gledhill Road Machinery Co., Galion, Ohio. The unit is the Model 7-A grader with a rear strike-off blade added. Downward pressure can be applied to this blade, exerting up to one-half the total weight of the machine. The drawn-type unit uses an 8 to 10-foot moldboard that lifts 12 inches above ground.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 138.

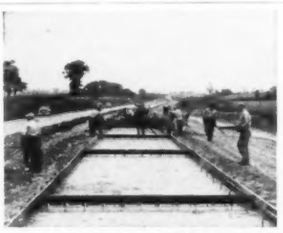
"BERG" Concrete Surfacer

A light-weight, portable, electric moto/-driven Concrete Surfacer consisting of the Model R2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete buildings, bridges, dams, walls and many other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.
4665-4669 Spring Grove Avenue Cincinnati 32, Ohio



Always a smooth road ahead *on the Pennsylvania Turnpike*

Pennsylvania Turnpike Commission

350,000 FEET OF FLEXCELL* JOINT FILLER

ASSURE SMOOTH, TIGHT, MAINTENANCE-FREE JOINTS!

No bumpy, bulging joints—no gaping crevices—no costly maintenance, when you use Flexcell Bituminous Fibre Expansion Joint Filler wherever concrete meets concrete!

Flexcell Joint Filler is made with a tough, durable cane fibre base containing millions of tiny air cells. These air cells permit Flexcell to absorb pressure from expanding concrete without extruding—and spring back to keep the joint closed when the concrete contracts. Thus, practically maintenance-free joints that *stay* smooth, tight and attractive are assured!

Low in Cost

Flexcell Joint Filler is easy to handle, easy to work with. Provides neat, finished joints without trimming. It is impregnated with asphalt to resist moisture—and protected by the patented Ferox® Process against dry rot and termites. Withstands toughest service, severest weather conditions—saves on maintenance year after year. Yet with all this, it is *low in cost!*

Flexcell Joint Filler has long been specified by leading engineers, contractors and architects—as well as the United States Army, Navy and other Federal, State and Municipal agencies. It will pay you to discover the reasons for this preference . . . *before* you start your next job!

Mail coupon below for complete information on the advantages and economies of using Flexcell Joint Filler for pavements, runways, sidewalks, curbs, gutters, driveways, concrete floors. No cost or obligation!

Another CELOTEX *Product*
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BITUMINOUS FIBRE EXPANSION JOINT FILLER

The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark identifying Bituminous Fibre Expansion Joint Filler marketed by The Celotex Corporation.

MAIL COUPON TODAY!

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120 S. LaSalle St., Chicago 3, Ill.
Without obligation, please send me complete data and prices on Flexcell Bituminous Fibre Expansion Joint Filler.

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Concrete Setting In Cold Weather

Effective Means of Heating Water Without Stopping Plant Operation Speeds Concrete Setting

• TO accelerate the setting of concrete after pouring from transit-mixing trucks during cold winter weather, the Wel-Don Concrete Corp., Westfield, N. J., has an effective means of heating the water for the mixing trucks at its Ready-Mix Concrete plant at Fanwood, N. J., in the Watchung Mountains. The sand and gravel are not separately heated, and any frozen lumps in them are thawed out by the hot water during mixing.

The plant capacity is 750 cubic yards of concrete per day, with a fleet of twenty Mack 10-wheel-type 6-yard units for transit mixing.

Water-Heating System

The water-heating arrangement as devised by Alexander Genard, General Superintendent of the plant, provides for ample water-heating capacity and storage without any interruption of plant operation. It is very economical in fuel consumption and does not require operation before or after plant hours. No waiting for hot water—it is always available as needed, because of the tank's storage capacity, insulation, and efficient method of heating. Water is heated at the same time as it is being used from the tank and during the latter's simultaneous refilling.

The installation has 20,000-gallon water tank fired by immersion tube. The tank is 32 feet long x 10 feet in diameter with a main firing tube of 12-inch diameter leading into two 10-inch-diameter return flues. The oil-burning system has a No. 782 Hauck proportioning oil burner with a 3-hp 16-ounce blower, a ¼-hp oil pump, a Wheelco Electric Eye and Flame-O-Trol with a manual reset relay, and a Minneapolis-Honeywell Aquastat.

The desired water temperature in the tank is 160 degrees F during very cold weather and about 145 to 150 degrees for less severe days. The heated water from the tank flows by gravity to the loading station for the mix trucks.

If needed, a maximum potential capacity is available to heat 10,000 gallons of water from 32 to 165 degrees F at the rate of 10 degrees per hour. Water for refilling the tank is pumped from a nearby brook, which often has a covering of ice during the cold weather.

The tank has a capacity of about 19,000 gallons of water. Overnight, there is only a loss of 4 to 10 degrees F in water temperature. The tank is insulated all around with a 3-inch thickness of magnesia block and asbestos cement with wire reinforcing. Ends of the tank are left uncovered to warm up the inside of the building in which the tank, water pump, and oil-burning system are located.

Operation

The amount of water used during the morning causes the tank contents to drop to some 14,000 gallons by about 11.30 a. m., when the burner is started. While the burner is firing, a pump is refilling the tank at the rate of 2,000 gallons of water per hour. At the same time, heated water is being used at the rate of 1,000 gallons per hour by gravity flow to the plant. The burner consumes about 12 gallons of oil per hour for 5 hours, making a daily oil consumption of approximately 60 gallons. By 4.30 p. m., the tank contains 19,000 gallons of water, heated to a temperature of 165 degrees F. When this temperature is reached the Aquastat, by actuating a solenoid oil shut-off valve, automatically shuts off the burner flame. An Electric Eye flame safeguard then causes the burner blower and oil pump to shut down and remain inoperative. The burner does not start again until a manual reset relay is operated for its subsequent relighting by hand. With the Electric Eye flame safeguard and Aquastat control, the burner operates without any labor supervision after starting.

Advantages

The oil burner's flame pattern and rapid clean combustion characteristics have proved ideal for the immersion-tube-firing system of the tank. There is no smoke and no soot formation as had been experienced with a different type of equipment. Proper oil-air ratio is maintained over the entire range of the burner by automatic proportioning.

It has been proved that the system of immersion-tube heating gives fast and efficient transfer of heat. The firing tube is always surrounded by water to be heated, thus avoiding the less efficient and slower heat transfer of a fire-box arrangement. The burner is mounted on a short steel-jacketed refractory ignition tile with a spacing outside of the tank for induced air intake.

Besides obtaining heated water at moderate cost, the management feels the installation does not involve the maintenance expense incurred by conventional boiler tubes, fire-box refractories, etc.

The heated water is also used for washing out the cement-mixing units. A standpipe connection from the tank has been installed so that water will be available for fire protection in the Wel-Don and two adjoining crushed-stone and paving plants, regardless of cold-weather temperatures.

You can help rebuild war-wrecked libraries in Europe and Asia by contributing money to CARE, 20 Broad St., New York 5, N. Y.

Eliminate 70% to 90% of Conveyor Downtime

Cedarapids Schrock Built by IOWA

MOTORIZED HEAD PULLEYS

eliminate maintenance on chains, belts, sprockets, Universal drives, countershafts, etc.

U.S. Pat. No. 3548399—Others Pending

EVERYTHING is contained INSIDE the pulley shell!

HERE'S a money-saving departure from conventional conveyor drives. A Cedarapids-Schrock *Motorized* Head Pulley is simply a new application of the long-proven gear reduction drive, with everything... electric motor, reduction gears and all moving parts... contained inside the drum, completely protected from grit, dirt and weather and with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime is saved by eliminating the exposed parts necessary with conventional pulley drives. In operation, the pulley shell rotates about the electric motor which is held stationary by a torque arm attached to the conveyor frame. The speed of the shell depends on the combined reduction ratio of the pinions and gears inside the shell. Compact, easy-to-install, job-proved Motorized Head Pulleys are available in sizes from 5 to 30 HP and in various widths.

Find out all the advantages of converting your belt conveyor or belt-bucket elevator installations to *motorized* efficiency before you need head pulley replacements. See your distributor today, or write for Bulletin MP-1.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

Built for sale in Arizona, California, Nevada, New Mexico, Southern Oregon, Southwestern Utah and Texas by
YUBA MANUFACTURING CO.
(Pulley and Sprocket Department)
Benicia, Calif.

The New Scythette POWER SCYTHE

CUTS WEEDS, GRASS, REEDS

4 TIMES FASTER THAN ORDINARY METHODS

NEW POWER • NEW ENGINEERING

Now equipped with double power, double fuel capacity. Trims weeds on rocky or uneven ground. Cuts grass or weeds close to buildings. Clips off reeds or underwater growth. Cuts with ease wherever a man can walk, wade, or row a boat. Equipped with new two h.p. motor, one quart capacity gas tank, 20" oscillating cutter bar. Weighs only 26 pounds.

a twist of the wrist and the SCYTHETTE becomes the Sawette

America's most revolutionary chain saw cuts trees, or any growth up to 6" in diameter, level with terrain while operator is in upright position. Speedy, efficient, rugged, the Sawette is the answer to heavy growth clearing problems.

WRITE FOR FREE LITERATURE

Hoffco, inc. RICHMOND, INDIANA

NOTHING ELSE LIKE AMAZING NEW

MEAD "MIGHTY MOUSE" BABY DOZER and TRACTOR

USEFUL FOR: Estate Owner, Landscaper, Municipalities, Street and Park Departments, Contractors, Project Engineers, Cemeteries, Sub-Dividers, Institutions. Write for FREE Circular.

HIGH LIFT or LOW LIFT MODELS

Mead's MIGHTY MOUSE High Lift Tractor-Dozer pivots within its own length. Weighs only 1300 lbs. yet dozes and hydraulically lifts a 5 cubic foot capacity bucket up to 6 feet! Machine only 40½" wide, 95" long, 2 speeds forward and one reverse, 6 hp. engine. Front end attachments are bucket, dozer blade, mower or rotary broom; rear end pulls rotary tiller, cultivator, plow, scarifier etc.

It's a perfect answer to so many labor problems that we'd like to show you how it will do a dozen jobs wherever you have grading, excavating, back filling, towing, loading, snow plowing, brush removal, site clearing, road building and you think of the rest! Hydraulic lift, just like the big ones.

IT GRADES: Large tread area, "geared to the ground," gives lots of traction for a heavy thrust. You can really push things around with "Mighty Mouse!"

IT CARRIES: Easily carries heavy loads, piles material high, climbs steep slopes.

IT DUMPS: Bucket trip lever at driver's left hand dumps load instantly, effortlessly, exactly where needed.

IT BACKFILLS: "Mighty Mouse" can soon pay its cost on this work alone, doing the work of many laborers and eliminating rental of heavy machines.

MEAD SPECIALTIES COMPANY, Dept. T-653, 4114 No. Knox Ave., Chicago 41, Illinois

A 20-Ton Dump Body

A new 20-ton capacity tandem-axle straight-bed dump body is announced by Galion Allsteel Body Co., Galion, Ohio. The Morgantown body is made of 10-gage steel and has a full-size cab protector.

The Morgantown 20-ton dump body has an over-all body length of 20 feet.

Over-all body length is 20 feet. It is 84 inches wide at the floor level and 95½ inches wide at the point where side boards are inserted. Ends are 52 inches high with boxtype corner posts which anchor two 11-inch removable steel sideboards. The body is reinforced by 6 steel V-type braces and has a tailgate that is 35 inches high.

Dumping is handled by the Galion Model 77353 hoist. This consists of two 7-inch twin-ram 3-stage twin-telescopic cylinders. Rated hoist capacity is 20 tons.

For further information write to the company, or use the Request Card at page 18. Circle No. 3.

Compressed-Air Filter

A filter that removes water and sludge from compressed air is described in literature from the Hankinson Corp., 153 Biltmore Bldg., 951 Banksville Road, Pittsburgh 16, Pa. The unit acts as a dehydrator, a mechanical filter, and a trap. It features a disposable cartridge which is removed and replaced when dirty. The bulletin gives technical data and dimensions.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 79.

Power-Spraying Equipment

A catalog on power-spraying equipment is available from Dobbins Mfg. Co., Elkhart, Ind. Equipment suitable for weed-control spraying includes 25 and 50-gallon 2-wheel push-type units and trailer-type sprayers.

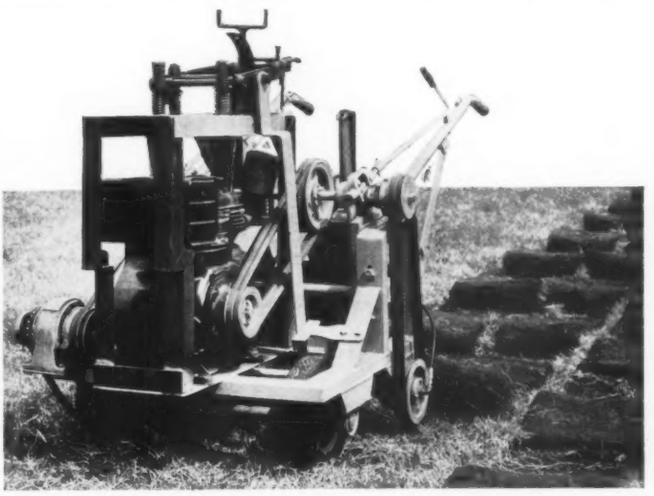
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 118.

Concrete-Curing Membrane

Literature is available on a transparent membrane concrete-curing compound made by the Aquabar Co., 623-624 Commercial Trust Bldg., Philadelphia 2, Pa. Kuraseal "A" forms a transparent film on the concrete surface to prevent evaporation of the moisture required for complete hydration of the cement. The compound is said to prevent surface dusting, and to reduce hair checking and crazing. According to the manufacturer, it will help to obtain a specified concrete strength and an abrasion-resistant surface.

The company also makes portable spray machines for applying the compound.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 75.



Power Sod Cutter Makes Sodding Easy!

Now any sodding project can be completed in fewer man-hours at much lower cost. The Phillips Power Sod Cutter, with its 8-hp. Briggs & Stratton Motor, has been in use for over twelve years on the toughest sodding jobs. It gives a uniform cut on both sides, underneath, and any length.

Completely adjustable, it follows the contour of the ground. The secret of its smooth operation is the vibrating blade. Compact and self-propelled at a walking pace. Write for a folder and save on your next sodding job.

Phillips Power Sod Cutter

619 SOUTH 15TH ST.
LAFAYETTE, INDIANA

There's A Lansing Barrow For Every Contractor Need!

Lansing Company has been designing and building wheelbarrows for the construction trade since 1881. Experienced design, rugged dependability and quality materials are a part of every model in Lansing's complete line of wheelbarrows.

LANSING F4½ and A4½ WHEELBARROWS

The most popular barrows on the market for handling wet concrete. Capacity 4 cubic feet. 16 gauge steel trays with new hard enamel finish. Choice of wheels.

ASK YOUR DISTRIBUTOR OR WRITE FOR DETAILS ON LANSING WHEELBARROWS

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LANCO MATERIAL HANDLING EQUIPMENT

Home Office and Factory
LANSING, MICHIGAN

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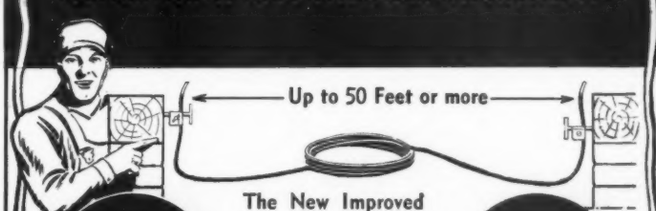
FASTER THAN $100 ENGINEER INSTRUMENTS



Regular 50 Feet **$8.95**

The New Improved Water Level For Simplest One Man Operation

Anything you need level Levelall does it.
Dealer inquiries Invited

DeLuxe 75 Feet **$12.95**

A sturdy instrument that can be left on the job for any workman to use. Cannot be put out of adjustment and even with the most casual handling its principle is so simple anyone can level points quickly and accurately.

For footings, forms, batter boards, sills, lintels, floors, ceilings, roads, driveways, lawns, piping, farm contouring and all general construction work normally needing an expensive instrument.

1 qt. extra Level-Flo Liquid shipped with Deluxe Model only.

Complete with instructions, high quality vinal polechloride tubing filled with Level-Flo Liquid, mounting brackets, and metal case.

LEVELALL, 99F Webster St., Rockland, Mass.
Mail me ... ... 75' DeLuxe Levelall @ $12.95
Mail me .. 50' Levelall Instruments @ $ 8.95
you guarantee satisfaction or money back upon return of Levelall within ten days.

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City ..... Zone .... State .....
☐ Send C.O.D. I will pay postman full purchase price plus delivery charge on arrival.
☐ Full purchase price is enclosed. Send postpaid. (Postage prepaid on orders in U.S.A. only).

A $1,200,000 addition to the Elkhart General Hospital, Elkhart, Ind., gets underway. A workman holds a Model M-13 White concrete vibrator with a new high-speed 2-inch vibrating head, preparatory to putting in the form. The vibrator is powered by a Wisconsin AKN 6-hp engine.

They're TOPS for

BIGGER PAY LOADS

Hauling dead weight cuts profit. With Heil Bodies, you haul *pay load,* because every unnecessary pound is eliminated. Yet there's no sacrifice of structural strength! Correct design and no-sag construction assure long years of profitable service life.

FEWER REPAIRS

Heil's simplified Hydraulic Hoist design eliminates unnecessary troublesome parts. The arm assembly, for example, is made of structural steel welded to extra-heavy reinforced tubing. This application of the simple toggle principle means fewer repairs. Rugged construction keeps you out of the shop, on the job.

LESS LOST TIME

Fast dumping action and trouble-free operation save time on the job. Low mounting height makes hand-loading faster and easier.

There's a Heil distributor near you to explain every Heil Body and Hoist advantage for your specific job, and supply you with prompt, dependable service and parts. Call him today.

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DEPT. 353 3003 WEST MONTANA STREET, MILWAUKEE 1, WISCONSIN

Factories: Milwaukee, Wis. — Hillside, N. J.

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BH-1

Heil Platform Conversion Hoist | Heil Scrapers | Heiliner 2-wheel Tractor and Scraper | Colecto-Pak

Waterproofing Compound

A waterproofing compound that seals and preserves masonry, plaster, wood, and wall board is described in a booklet from the Haynes Products Co., 4007 Farnam St., Omaha, Nebr. Formula No. 640 is a clear liquid that may be sprayed or brushed on. According to the manufacturer, the compound is effective on any material that it can penetrate.

The booklet gives details on characteristics of the product and what it will and will not do. Other Hayproc products covered include paints, a cement hardener, a rust remover, rubberized enamel, and a plastic roof cement.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 16.

Literature on Toll Booths

A booklet on toll-collection equipment used on super-highways and bridges is issued by the Electronic Signal Co., Dept. CE, 541 Willis Ave., Williston Park, N. Y. Since millions of dollars in tolls are being handled annually, precision registering and counting devices as well as visual signal checks have been developed, and are in use at the more modern installations. Toll booths are prefabricated and include air conditioning, heat, and many conveniences for operation all year around.

This booklet includes a glossary of modern toll equipment terms.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 111.

Diesels for Construction

Diesel engines for shovels, ditchers, compressors, crushers, and other construction equipment are discussed in a new booklet issued by Caterpillar Tractor Co., Peoria 8, Ill.

Twenty-seven photographs of various pieces of equipment powered by diesel engines are contained in the 8-page booklet. A chart shows the horsepower and kilowatt ratings of the company's engines and electric sets. The back cover lists some of the manufacturers whose machines can be fitted with these units.

To obtain this literature write to the company for Form 30601, or use the Request Card at page 18. Circle No. 43.

Stationary Concrete Mixers

Literature is available on a line of stationary concrete mixers for use in the manufacture of concrete blocks. Capacities of the mixers range from 15 to 50 cubic feet. The units have lined bowls and ends. Paddles are adjustable.

To obtain this literature write to General Engines Co., Inc., 307 Hunter St., Gloucester City, N. J., or use the Request Card at page 18. Circle No. 24.

STATES AND COUNTIES ARE SAVING TAX MONEY

By Salvaging Old Oil Macadams

NORTH HOLLYWOOD, CALIF. — Reports from many sections of the country are revealing a practical way of making road and highway dollars go farther. By the simple expediency of re-claiming old or worn-out asphaltic oil mats or oil macadam, literally hundreds of thousands of dollars are being saved.

Until recently there has been no economical method of re-claiming these old mats. However, with the introduction of the Wood P-600

A Wood Preparizer pulverizing and blending 1½" to 2" asphalt with 2" of base material — *in one pass.*

Preparizer, this problem has been completely whipped.

The Wood P-600 Preparizer, in one operation, scarifies, pulverizes and prepares old asphaltic oil mats for 100% re-use. Even the old oil is retained. Nothing is lost. Aggregate is returned to its original size in one to three passes, ready for re-mixing and lay-down.

The savings are obvious. The expense of equipment and manpower for importing materials is completely eliminated, and aggregate costs are reduced to a fraction of the normal outlay.

The Wood P-600 Preparizer also blends different types of soil with water for better sub-base compaction. It prepares cemented gravels, caliche, decomposed granites, clays and other hard soils for mixed-in-place road and airbase construction. Teamed with a Wood Roadmixer, this versatile tool is attracting the attention of road officials and contractors everywhere.

Pulverizing old blacktop on a Montana county road.

Complete information may be had from any Wood distributor, or by writing Wood Manufacturing Co., Box 620, 6900 Tujunga Ave., North Hollywood, California. Export Office, 3938 Wilshire Blvd., Los Angeles 5, California.

Shallow Dirt Slows Storm Sewer Tunnel

Twenty Feet Per Day Is Good on This Los Angeles Job Where Tricky Excavation Hinders Tube Under City

• ONLY 18 feet beneath the busy traffic of Los Angeles, tunnel men are fighting a slow but winning battle—unknown to most of the people above them—to bring new storm-runoff protection to the City of Angels. For almost a mile, under Vignes and Ducommon and Alameda and Aliso Streets, crews of the G. E. Kerns Construction Co. of Long Beach are meeting shallow overburden, tricky digging, ground water, 11 alignment changes, and other problems.

The cost of their $1,500,000 contract will be shared both by tne City of Los Angeles and the State of California. State participation was assured when it became necessary to depress below normal street level part of the Santa Ana Freeway in that vicinity.

In its tortuous course between a point 150 feet north of the Alameda-Macy Street intersection and the Los Angeles River channel near the end of Ducommon Street the tunnel has 11 curves as its alignment changes. The twisting course was necessary not only to avoid important utilities in the area but to pick up storm water from adjacent city streets to the best advantage. The low-level freeway sections in the vicinity are especially vulnerable to heavy rains. Without the protection of the new facility, the depressed levels of the adjoining freeway were potential drain sumps, and their protection in this regard was one of the important considerations when their design was made by the California Division of Highways. At peak operation, the Los Angeles-Alameda Street storm tunnel is expected to carry 1,400 cfs of floodwater to its junction at the Los Angeles River.

Horseshoe Cross Section

The big tube has a horseshoe cross section with an inside diameter of 11 feet 6 inches. Its walls consist of reinforced concrete varying in thickness from 24 inches at the invert to 12½ inches at the top of the arch. As additional wall protection, the Armco steel tunnel-lining plates—put in as excavation progresses—will form the back of the reinforced-concrete lining.

The 11 alignment changes were so arranged that the curves could be made with Armco liner plates in the case of excavation, and with 8-foot steel liner sections in the case of concrete lining.

Tricky Excavation

There were many optimistic predictions of 40 feet of tunnel excavation per day when George and Fred Kerns made their successful bid. There was just one catch. Every theory defied any practical application to make it work. Only by the most careful kind of planning, constant supervision, and tight programing have the excavation crews been able to average 20 feet per day.

The trouble is a combination of materials and their location. Every one of the materials is tough to tunnel. There is clay, sand, gravel, and silt in several natural stages of compaction. The formations are often loaded with ground water. The tunnel crown is only 15 to 18 feet below the busy traffic on city streets. The intervening overburden is loaded with water and sewage lines, gas mains, storm sewers, and other utilities. There have been times when the Kerns brothers could have used a few sticks of low-velocity powder to good advantage, particularly in the tightly compacted silt, but the location of nearby utilities and traffic would not permit it.

Work began on the tunnel November 15, 1951. A small working space was created with the help of the Los Angeles Police Department, which blocked off Lyon Street between Aliso and Vignes Streets. A field office was set up here, along with a carpenter yard, materials-storage area, a steel yard, and an engineer's headquarters. A 20 x 20-foot tunnel-access shaft was also sunk from a point in this yard down to within a few feet of the tunnel walls. This shaft, close to the center of the project, permitted excavation both ways. It was mucked out by a Northwest truck crane and a McCaffrey 1-yard clamshell bucket. Another shaft 1,200 feet west of this point was sunk later on to facilitate removal of excavated material.

Several methods of tunnel excavation were attempted. The first scheme tried seemed best for this peculiar type of digging. It was soon adopted as standard procedure, after being modified in a few details. It consists of a bench-cut, needle-beam-supported method, using a 30-man mining crew split up into three shifts. While considerable hand

(Continued on next page)

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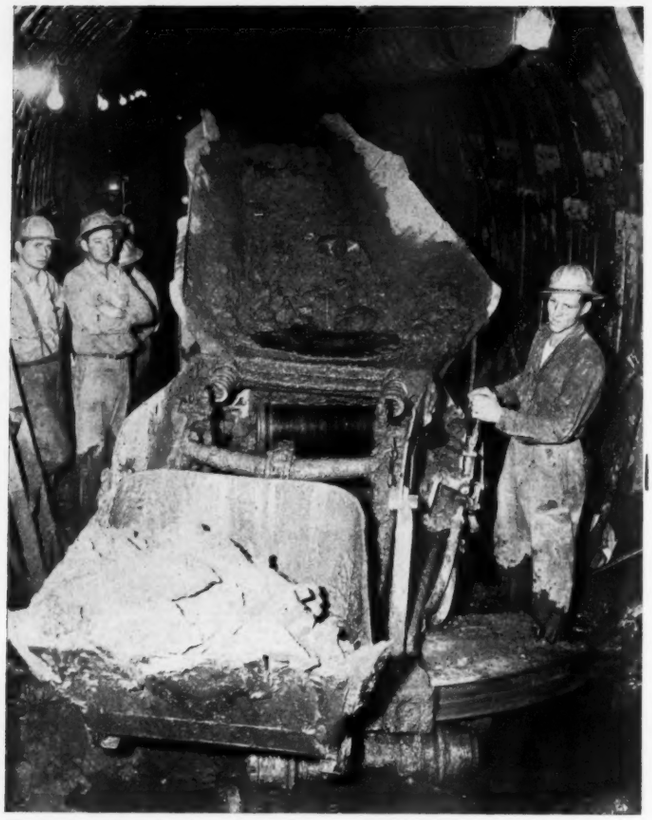

The Eimco Rocker-Shovel from the heading. It mucked out the lower 75 per cent of the Los Angeles storm-sewer tunnel prism. *Ray Day Photo*

Shallow Dirt Slows Storm Sewer Tunnel

(Continued from preceding page)

work is necessary because the tunnel has to be entirely supported, machines are also used to every practicable extent.

In advancing the tunnel face, a small mine-labor crew digs ahead with hand tools on the upper 6 feet of the arch. They leave a bench behind them. The gravel and sandy material above their heads is held in place temporarily by 1 x 6 board spiling, driven ahead as mucking continues. As soon as 18 inches of the arch face is removed, an 18-inch section of Armco tunnel-liner plate is brought in and bolted to the preceding panel. Digging then continues by hand to the spring line, and other sections of Armco liner are attached. Excavated dirt is shoveled into wheelbarrows and hauled back about 30 feet, where it is dumped off the edge to be picked up later by the mucking machine. The arch panel liners are supported temporarily by a timber beam held up by vertical timbers intersposed between its lower edge and the top of the unexcavated tunnel prism.

To help support all this arch paneling, a frame of 12 x 12 timbers is erected about every 20 feet over the railroad tracks at the end of the bench. Two needle beams, either of 12 x 12 timber or steel I-beams, are extended ahead from the top member of this frame into the bench as far as they will reach. Screw-type jacks, placed between this needle beam and the arch plates, help to support the roof while the bench is being excavated.

The main prism below the bench was mucked out by Eimco Rocker-Shovels. An Eimco 40 did most of the mucking, however, but the 21-B also worked and was available as a standby unit. According to the owners, Fred and George Kerns, the Model 40 worked steadily for approximately one year for less than $500 worth of maintenance and repair. Using H&L teeth on its bucket, it dug even the cemented silt at a rapid clip. In fact, this part of the tunnel excavation was so rapid that the Eimco crew worked one shift less per day than the miners who advanced the arch portion of the heading.

Excavated material from the Rocker-Shovels was loaded to 4-cubic-yard mining cars. These were pulled by a Greensburg Monitor storage-battery locomotive over a 24-inch gage railroad to dumping sumps at the vertical shafts. The material, after being dumped from the cars into these sumps, was clammed out by a Northwest truck crane and a McCaffrey 1-yard clamshell from above. Two 8-yard dump trucks operating from this point carried the material to the disposal area off Bishop Road in the Elysian Park area.

As the lower part of the tunnel prism was excavated, the Armco liner-plate installation was continued down toward the footing. The end of each liner section was set on heavy timbers. Makeup of the steel liners was remarkably easy under any and all circumstances, according to George Kerns, and even in the curve sections the liner plates were easily installed. At each change of tangent a short gusset section was fabricated and installed, followed by the installation of regular sized plates.

Trouble With RR Tracks and Water

The excavation problem was always tricky, but it became even more so when the tunnel had to be taken under the Southern Pacific railroad tracks on the west bank of the Los Angeles River. Historians believe that the disastrous flood of 1913-14, which threatened to leap out of the then-unlined Los Angeles River banks, caused the railroad company to dump in huge chunks of granite riprap. Subsequently the tracks were raised over this concentration of boulders. When Kern's men tried to tunnel under the railroad tracks they came head-on into the huge boulders which blocked the way.

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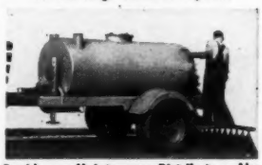

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stantly, causing the dirt to rattle down so badly the spiling had to be stuffed with hay and excelsior. It was impossible to use powder. Train service could not be interrupted, so an open cut at this point was out of the question. All the larger boulders had to be broken up laboriously by the plug-and-feather method. But special care had to be exercised when the particles were taken out to insert the spiling and hay very quickly, because the tricky gravel sifted in every time a passing train vibrated the material. Had any of the material supporting the railroad tracks been permitted to cave in, it would have been a major disaster.

Near the outlet portal another complication arose when a 42-inch concrete storm drain showed up where it was not supposed to be. Surveys had shown it to be clear of the tunnel. The arch excavation advanced as scheduled, and because the storm drain lay at a low elevation, it was not intercepted. When excavation of the rest of the prism took place, about half the pipe's diameter was found to stick out into the tunnel. The tunnel was then moved 18 inches north. Since the arch excavation had already been made under the nearby railroad tracks, additional digging was then necessary to remove material from behind the liner plates for the change in alignment. Everyone was happy when that point was passed.

Another problem of importance, particularly early in the game, was ground water. When the first shaft was excavated, everyone was appalled to find about 2 feet of the lower part of the tunnel prism under the water table. Kerns placed a 6-foot sump in the bottom of the shaft and installed a Barnes 4-inch centrifugal pump, because he realized that considerable sand and mud would have to be handled along with the ground water. The ground water was high in sulfates, and the solution was tough on anything made of iron or steel. Parts of the pump were replaced with bronze shafts and bushings to stand up under the sulfate. The machine did a successful job of dewatering the 24-inch water-laden material, and later on, after its work was largely finished, a smaller electric pump was installed to take care of routine seepage.

Auxiliary equipment to help the excavation phase includes a Chicago Pneumatic 600-cfm air compressor, set up on the surface; a Joy Axivane No. 1000 blower at the shaft; and several smaller blowers at openings in the roof.

Concrete Lining Pumped In

Concrete lining is somewhat complicated by the many changes in alignment, but aside from the single problem of rounding the curves, it is a routine operation. The invert can be placed in sections up to 180 feet long ahead of the archlining. Lining in tangent sections is set up on a basis of 64 feet per day. It takes considerably longer to get around a curve. Specifications require 12 hours of setting time before the forms can be stripped.

The forms are City-owned, having been used previously on storm sewer tunnel work. They consist of 8-foot sections, each equipped with its own adjusting jacks. A narrow-gage railroad track over the completed invert carries a small dolly which is used to move the forms ahead. In ordinary lining pours on a tangent section, 8 of the panels are fastened together by flanges, nuts, and bolts to make a 64-foot pour. The panels are also used in rounding the curves, but it requires careful manipulation

(Continued on next page)

Here the Rocker-Shovel pours excavated material into a dump car from its discharge belt.
Ray Day Photo

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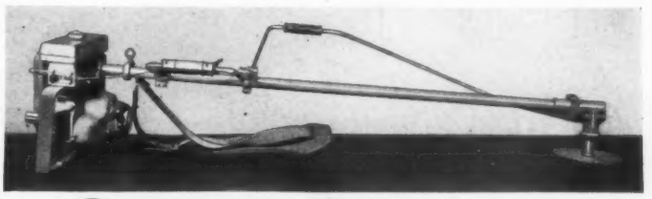

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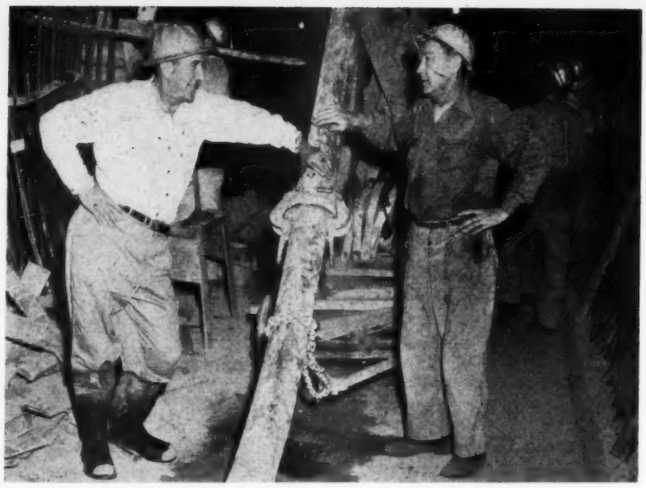
(Continued from preceding page)

and extremely accurate setting and bracing.

The lining is sufficiently thin to prevent a man from working inside the forms, so all concrete is being vibrated from outside. Dreyer vibrators fastened to the steel from panels vibrate some of the material, while Viber electric vibrators extended through hatchways consolidate some of the concrete inside the forms.

All concrete is placed by a Rex 160 Pumpcrete machine, which is set up above the tunnel in street areas. The setups are planned so that the machine never pumps concrete more than 500 feet. Blue Diamond Corp. is furnishing the fresh concrete in truck mixers, which haul from a commercial plant 4 miles away. The Pumpcrete slick line is carried through to the far end of the form, and when lining begins, the slick line is left in place until the concrete builds up from the floor line all the way to the crown. The slick line is not pulled back until it is embedded about 5 feet in fresh concrete. As the concrete builds up, it is vibrated through the hatchway doors, which are closed when the material builds up to the various levels.



G. E. and Fred Kerns of G. E. Kerns Construction Co., Long Beach, stay on the job and keep the details ironed out. They are standing beside the Pumpcrete delivery line.

Ray Day Photo

After 12 hours in place, the concrete usually attains about 350 psi of compressive strength, and the forms can then be collapsed and moved ahead. The collapsing operation is sufficient to let sections move through where other forms might be in place. As soon as a pour is stripped, the surface is cured by an application of Hunt Process solution. The concrete crew consists of about 30 men in all, including foremen and supervisors. Lining progressed from the Los Angeles River as soon as possible to get that section out of danger from a flood in case winter rains swelled the river and caused backwater to enter the tunnel portal.

The project is scheduled for completion by July 1, 1953. After that time, thanks to the hard-working crews who risked life and limb beneath busy traffic of metropolitan Los Angeles, the new freeways and streets around Union Station will be free from flood danger.

Personnel

The tunnel is a project of the City of Los Angeles, having been designed by the Storm Drain Division of the office of City Engineer Lloyd Aldrich. Floyd Doran was in charge of design work. Field inspections and engineering are under the supervision of A. J. Sutcliffe, Resident Engineer, assisted by G. G. Thomas, Roy Lawrence, and Ben Morris. Al Wright was in charge of surveying.

G. E. and Fred Kerns are directing field operations for their construction company. Other key personnel include Superintendent M. G.

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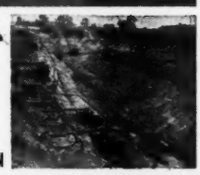

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Holwick; Shifters John Samstead, Joe Yankosky, and Mike Jurovich; Master Mechanic Lloyd McNeece; and Project Engineer Eddy Maffit. Wm. Thompson is Concrete Lining Foreman.

Reinforcing steel was placed under subcontract with Anthoy Meehelis, with field work in charge of Herman "Dutch" Raspe. Reinforcing steel was supplied by Bethlehem Pacific Coast Steel Co., and Rossman Lumber Co of. Long Beach supplied the many truckloads of timber necessary to finish one of Los Angeles' most important tunnels. Moran Engineering Co. of South Gate, Calif., built the side-dump cars and collapsing steel liner forms for the 9-foot 3-inch horseshoe tunnel. This firm is the local representative for the Eimco Rocker-Shovel and the Greensburg Monitor storage-battery locomotive.

Steel Service Plant For Ryerson & Son

Construction has begun on a new steel-service plant, consisting of two large building units and an office building on attractively landscaped grounds in Milwaukee, Wis. This is to be the completely new and much larger steel-service plant of Joseph T. Ryerson & Son, Inc., which will have approximately 166,000 square feet of floor space, or about three times the present plant capacity. It will be heated to preserve and protect the finish of special-quality steels, as well as for greater comfort of employees. The new plant is scheduled for completion early in 1954, according to a company spokesman.

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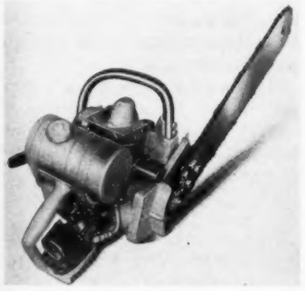

The Model 30 Lombard chain saw is available with 16 or 20-inch straight bar. It is powered by a 2-cycle, air-cooled, gasoline engine. For further information write to the Lombard Governor Corp., 36 Main St., Ashland, Mass., or use the Request Card at page 18. Circle No. 116.

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To obtain this literature write to the Oliver Corp., 400 W. Madison St., Chicago 6, Ill., or use the Request Card that is bound in at page 18. Circle No. 154.

Gen. Heavey Joins Firm

General W. F. Heavey, who commanded an engineer amphibian brigade in the Pacific under General MacArthur, has joined the engineering staff of Frederic R. Harris, Inc., New York City consulting-engineer firm, as Project Manager.

General Heavey's experience in waterfront projects includes preparation of the master plan for rehabilitation and modernization of New York City's piers, and supervision of a $31,000,000 improvement program of the port of Houston, Texas.

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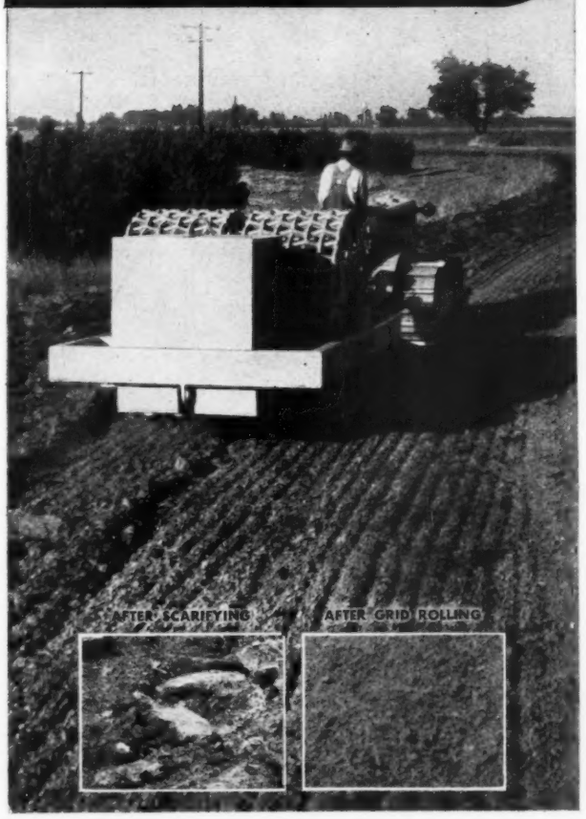

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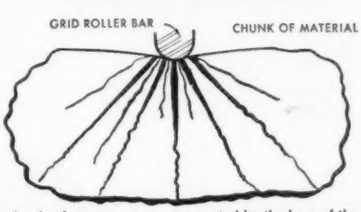

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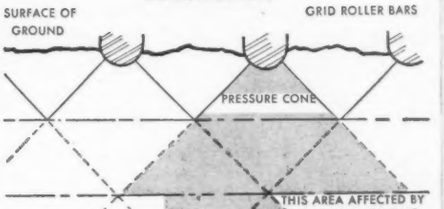

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By CHARLES E. GLENNEY, General Service Manager
Barber-Greene Co., Aurora, Ill.

• AS a manufacturer of construction equipment, Barber-Greene is vitally interested in safety surrounding the operation of equipment in the field. We are deeply concerned with every report of an accident involving personnel injury on any of our machines. We try to get the full details of how the accident occurred. The report is then thoroughly analyzed to determine if additional engineering design would help to prevent a future recurrence of the same type of accident.

We endeavor to keep posted on the safety codes of the various states as well as national codes and design our machines in compliance with them. Anyone in contact with our machines operating in the field is requested to report incidents involving safety and make suggestions for improving the safety factor.

It is from a fund of over 30 years' practical experience that the following observations on safety have been extracted. We hope that they may be of help to all those who operate heavy equipment in the field.

There are many phases which go together to make up the total on a construction project. For the purpose of clarification this presentation generally covers only such phases as apply to asphalt-plant equipment and to the laydown operation. For further simplification, we shall break these phases down to the following: (1) unloading; (2) transporting; (3) plant erection; (4) plant operation; and (5) laying operation.

Unloading

Let us assume that the various components of the complete asphalt-plant set have been shipped to the job site by railroad. It has been our experience that all too often there has been insufficient preparation made to handle the shipment on arrival.

If no unloading ramp is available, a temporary ramp must be built. This ramp should be constructed to withstand a load of 50,000 pounds. To support such a weight requires heavy timbers and blocking material which is sound and free from rot. We have found in the majority of the cases that little, if any, ramp material was available and all too often it was necessary to use half-rotted railway ties and old bridge planking in lieu of anything better. A little study, organization, and procurement of necessary material would go a long way to insure safe unloading of the equipment. Remember that if a machine is unloaded the "fast way", not only is manpower endangered but the inevitable damage to the equipment is generally very costly.

Too often there are not sufficient tools available to handle the unloading functions. Machines shipped by rail require sound and sturdy blocking, and plenty of it, to prevent equipment shifting on the cars, especially in these times of diesel locomotives with tremendous pulling torque. Several long pry bars are required to remove this blocking. Failure to provide these is apt to cause hernia, sprained backs, and strained muscles. Wire cutters for cutting the brace wires will expedite the job and are safer than using hammer and chisel to cut them.

If at all possible, a crane should be available for lifting those smaller units that are not portable. To unload them by hand is to invite injury unless workmen are well equipped with jacks, rollers, etc., so that the handling can be done with as little physical lifting as possible.

On wheel-mounted and crawler-mounted equipment, even though brand-new and direct from the factory, it is inadvisable to move them down the ramp without an adequate snub line attached.

Many a crawler-mounted machine has slid off the ramp because of neglect to put wooden strips over steel surfaces and failure to sand wet timbers.

Transporting

With the ever-increasing trend to greater portability, more asphalt-paving equipment is being either towed or hauled over the highways than ever before. Much of this equipment is designed for full semi-trailer mounting, equipped with a fifth-wheel hitch and air brakes. In

Wire Rope at Work—As you draw near New York City at the northern end of the 118-mile New Jersey Turnpike, this is the bridge that carries you high above the Passaic River. The picture, taken at a time when the bridge was near completion, shows two 146-ton girders for the main span being lifted simultaneously into place by Bethlehem Wire Rope.

These heavy steel girders made a tough lift, but no tougher than thousands of others entrusted to Bethlehem rope all over the country. Wherever there are heavy lifting or hauling jobs to be done, you will find Bethlehem rope right in the thick of things, hard at work. You will always know it by the black-and-yellow reel, the reel that tells you, "Here a good product is in service."

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most cases, however, it is impractical to provide springs under the rear axle; therefore it is necessary for the manufacturer to limit the transporting speed. We have seen many instances of excessive speeds on this type of equipment. What have excessive speeds to do with safety? Recently, I observed one of our gradation units which had been transported over the road a distance of approximately 200 miles. Of the eight bolts which secure the wheel disk to the hub, five were broken on each side with only three bolts remaining. The holes themselves had cracks extending from them and showed evidence of a peening action. Had the remainder of the three bolts let go, a serious accident could have resulted. The unit would have gone out of control and any traffic passing at the moment would surely have been involved in a collision.

I recall a contractor a few years back who decided to save a little money and double up on equipment to be transported over the road. He hooked one of our mixing units behind a truck, then hooked a gradation unit behind the mixing unit. Both units were 4-wheel trailer-mounted. Going down a hill at an estimated speed of 60 miles an hour the mixer, and subsequently the gradation unit, began weaving. The excessive stress on the mixer kingpin finally caused it to break. The front end of the mixer dropped down, letting the front end of the frame gouge into the asphalt pavement. This mixer, which incidentally weighs approximately 27,000 pounds, turned end over end while the gradation unit broke loose and rolled sideways. Fortunately, no one was injured, but the cost of putting these machines back into operation was at least half of their original purchase price.

There are other mistakes made in transporting. Often the truck or tractor unit is not of sufficient weight and horsepower to adequately handle the machine being transported. In other cases, the contractor's "lowboy" unit is grossly overloaded, causing tires to overheat, and in some cases, catch fire. Again, we have never seen quite enough blocking carried with the "lowboy" to support the unloading ramps.

At other times a load fails to clear an underpass by a few inches, causing extensive damage to the machine. All routes should be thoroughly checked for height of underpasses and the load height itself accurately measured to prevent accidents of this kind.

Too much attention cannot be given to adequate lighting and marking of the rear end of loads of equipment for highway transport. Daytime loads have a minimum requirement of red flags, indicating clearances and length of overhang. Even better is black-and-white striping of the trailer rear frame which can be easily seen by approaching motorists. Nighttime haulage greatly increases the hazard of rear-end collision. Failure to provide and insure proper functioning of tail and clearance lights amounts to something approaching criminal negligence. The prime mover should be equipped with adequate flares for use when necessary to stop on the highway.

It may seem elementary and superfluous to mention the above cautions, especially since the law usually requires these measures. Yet, for some reason or other, motorists continue to crash into loads of highway-transported equipment. Many of them do not live to tell how it happened.

As a rule, accidents involving transport of equipment do not generally involve injury to the transport driver. But too often an accident involves an unsuspecting motorist or pedestrian. Much care and planning must be accorded to the over-all phase of transporting heavy machines.

Erection

The equipment has arrived and there is a mad scramble to get the plant erected. Time is of the essence. This job has a penalty clause attached to it and you are already a week behind schedule!

The crane on the job should have considerable work done on the swing and hoist clutches. The brakes need realigning and adjusting and there are certain bearings that should be replaced. Jim is a good operator, though, and if he takes it easy he will be able to pick up the heaviest pieces and put them in place. Also, that soil at the plant site is not too stable, but the nearest source of good timber for adequate matting is 30 miles away so we'll get along with the few planks we have on hand.

These are famous last words.

What are you going to say when that crane has picked up a load and the operator finds he can't control the swing and one of the men gets crushed between the load and the part of the plant already erected? Or suppose everyone has been alerted that the crane might not be able to hold the load, but someone forgets and walks underneath the load just as the hoist clutch lets go.

Have your men been instructed as to the proper way of attaching a sling to the load so that the load will be properly balanced, that there will be no danger of shifting, or the load turning upside down? And how about those slings? When was the last time they had a load test put on them to see if they are still strong enough? Does the crane operator have access to sales literature and operating manuals so that he knows the weight of the various units he is going to pick up?

And about that matting . . . I saw a cold-feed hopper go over once with 25 tons of aggregate in it. By the grace of God no one was under it or next to it, but there could have been. A little extra matting to spread the weight of that bin over a larger area would easily have prevented this accident.

On another job I saw an asphalt tank of 20,000-gallon capacity settle, causing breakage of a live-steam line. Two men narrowly escaped being scalded by the escaping steam. On equipment like this we're dealing with real heavyweights and the only way to be safe is to spread that support matting out over plenty of area, so that your bearing pressures will be low.

And how many of you have ever seen the workmen wearing hard hats while erecting a plant? These plants get pretty well up into the air and it is very easy for a wrench, a hammer, or a loose part to fall just as someone else is walking directly underneath. The mines and steel erection contractors, to mention only a couple, have found that these hard hats really pay off in preventing injuries.

If anything falls it cannot only hit a man on the head, it can drop on his foot also. How about suggesting that the men wear safety shoes? They have saved literally millions of broken bones since their inception.

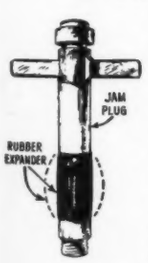
How about an adequate number of safe ladders for access to the various erection points? Must the men stand on rickety boxes, old nail kegs, and similar makeshifts, which are apt to collapse?

Operation

Your plant is now erected, but how safe have you made it? Have all of the guards supplied by the manufacturer been installed? Is the boiler of adequate capacity to take care of the plant requirements with a surge factor so that it will not have to be operated to the limit in order to pro-

(Continued on next page)

CB JAM PLUGS



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Safety Suggestions For Asphalt Workers

(Continued from preceding page)

vide sufficient steam? Has it been inspected by a competent boiler inspector to insure that it is perfectly safe?

How about those steam coils in the asphalt tank? Have they been checked to make sure that there is no leakage so that the asphalt will not foam up and overflow when steam is applied? Have all steam lines been checked for cracked fittings, properly functioning valves, etc., so as to preclude the possibility of a "blowout" along the line?

Have the fuel tank and lines been checked for leaks to preclude the possibility of costly loss of fuel and to eliminate a possible fire hazard?

If your plant is electrified, have all lines been inspected to insure that there are no "hot spots" in the lines accessible to any of the workmen? Has each machine been properly grounded? If night operation is planned, has a check been made to insure that all operational areas and potential danger spots are well illuminated?

And before you start operating—as a matter of fact before you started erection—did you take the pains to determine the location of the nearest hospital, the nearest doctor, and the nearest ambulance service? Did you have a complete and well stocked first-aid kit available for treating minor injuries? Many minor injuries have had serious consequences because of lack of foresight and planning to prepare adequately for emergencies.

Now let's start at the cold-feed end of the plant and follow the flow of material through the plant and point out some of the potential safety hazards.

If the aggregate is being fed by bulkhead and bulldozer, the bulkhead should be strong enough to withstand not only the weight of the aggregate against it, but the thrust of the bulldozer as it moves the aggregate into position over the feeder. Many a weak bulkhead has been known to collapse.

Often a total aggregate is made up of a blend of crushed stone or gravel, and sand. Many sands have a tendency to arch, requiring a laborer above the feeder with a pole to break down the arching.

We had a report a few years back where the dryer operator noticed that the sand was not feeding through the dryer. Going to investigate, he found a man's shoe protruding from the opening on the sand side of the feeder. There was approximately a 12-inch head of sand over the feeder. Apparently the rim on which the man was standing had given way, causing him to fall into the feeder. Before he could climb out, the bulldozer had pushed up another quantity of sand, covering him up. The man was dead before he could be freed.

If it is necessary for a man to be working under such conditions, he should be provided with a belt or harness with rope attached and secured to a portion of the bulkhead so that the distance of fall would be limited. Also, the rope would provide a means by which a man could pull himself out. Another safety precaution here would be to instruct the bulldozer operator that he should not push material into place over the feeder unless the laborer assigned to the bulkhead were in plain sight.

On cold feeds incorporating hoppers fed by clamshells, all personnel should be instructed not to climb upon the hopper while the clamshell is in operation. Also, all personnel should be instructed not to stand under the clamshell bucket at any point of its swing.

In most asphalt plants the cold aggregate is conveyd from the bulkhead or hopper to the dryer by means of an open-type bucket elevator. This elevator should be surrounded by a simple railing to prevent anyone accidentally falling into the moving bucket line. Due to the fact that the gates controlling the aggregate feed from the cold feeder to the bucket elevator are generally located directly above the bucket line, adjustment of these gates cannot be made without coming in contact with the bucket line. Therefore, all personnel should be instructed that a change in setting of these gates should not be made unless the bucket line is stopped.

In many cases the foot end of this bucket elevator extends below ground level, requiring a pit. The sides of this pit should be reinforced with timber to prevent the shoulder of the pit breaking away under the weight of a man standing on the edge.

Lighting the Burner

The greatest potential hazard on the dryer is in lighting the burner, especially if the flame has just been extinguished. The combustion chamber is still hot. Raw fuel coming in contact with the hot combustion chamber is readily vaporized into a highly combustible mixture which, if ignited, will flash back toward the man re-lighting the burner. Severe burns around the face and arms have been caused in this manner.

A good safety practice would be

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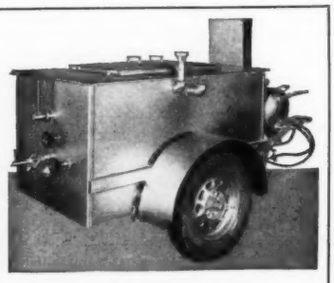

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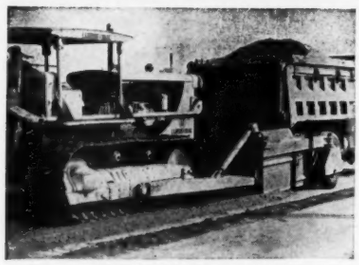

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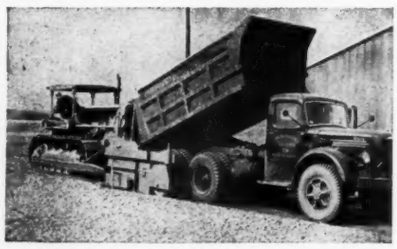

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to procure a plastic guard, protecting the entire face, and insist that the dryer operator wear this when lighting the burner. Also, he should be instructed to button his shirt collar and keep his sleeves rolled down to minimize the area exposed to a possible flashback.

The dryer operator should be instructed to stand to one side, out of line of the path of a possible flashback. He should also be well schooled in the cardinal rule of lighting all burners, that is, to open the steam or air valve before opening the fuel valve so that there will be no raw unatomized fuel introduced into the combustion chamber.

All steam lines around the dryer should be either wrapped with insulation or painted a striking color to prevent any of the plant personnel from inadvertently taking hold of a hot steam line. Steam pressure of 125 pounds is equivalent to 350 degrees F. Such a temperature will create a severe burn almost upon contact.

The screening unit of an asphalt plant, as stated previously, is a rather tall structure. Therefore, accent should be placed on safety while climbing to the top of it and while working topside. All ladders should be periodically inspected. Handrails should be in place and secure. Any openings in the handrail should be spanned with a bar or chain while personnel is working topside to prevent someone accidentally falling through the opening.

It is occasionally necessary for a workman to crawl inside the bin before it has a chance to cool off. Many workmen do not realize that it is possible to be quickly overcome by this heat. Therefore, if it is necessary for someone to enter the bin, he should have a rope around his waist with another workman topside to pull him out in the event that he is overcome.

The reject spout from the screen discharges an occasional oversize stone, pieces of steel, wood, etc. In the event that this reject discharges to the ground, the area in the immediate vicinity should be roped off, or some other type of guardrail provided to prevent a workman inadvertently walking into the path of discharging material.

The Pugmill Is Dangerous

Without a doubt the most dangerous portion of the mixing unit is the pugmill. In spite of the fact that manufacturers provide adequate covers for pugmills, operators seem to find ways of getting caught and mangled. It would be well always to place near the pugmill, in full view, a sign in bold letters: "THINK". As a matter of fact, several of these signs around an asphalt plant would probably reduce accidents and injuries.

Now a word about the various drives around an asphalt plant, principally chain and sprocket, V-belt and shaft drives. Chain and V-belt drives should create no hazard at all if the guards are left in place. All the same hands and arms do get caught in them, generally because of reaching through the drive trying to get to something on the other side—possibly a grease fitting.

Here one of the cardinal safety rules applies. Never try to lubricate, make an adjustment, or attempt to make any kind of repair on a machine while it is in motion. If the machine is stopped, make sure that the engine is also stopped, or if it is an electric-powered machine, make sure that there will be no one else to start that motor unknowingly while the machine is being worked on.

Rotating shafts probably are responsible for about as many disrobings as a strip-tease artist. The general pattern is that a man's trouser leg is caught by the rotating shaft, then the shaft begins winding the trouser leg up. Sometimes the victim gets off with no more than severe bruises, but more often broken bones are sustained and all too often fatal injuries result.

There are three ways to prevent an accident of this kind. First, such shafts should be guarded as much as possible. Secondly, personnel should be constantly cautioned to keep away from rotating shafts. Third, loose and baggy clothing should not be worn, and trouser legs should be tied close to the ankles.

Beware of Hot Asphalt

Too much care cannot be exercised when working around hot asphalt. Asphaltic cements are usually applied at approximately 285 degrees and are generally heated in the storage tank to approximately 300 degrees. Hot asphalt, coming in contact with the skin, adheres like glue to whatever it touches and causes a very nasty burn. The greatest hazard in handling asphalt is that a valve might be turned the wrong way allowing the hot asphalt to spray some unsuspecting workman.

Asphalt lines connecting storage tanks and the mixer should either be placed overhead, so that a person can walk under them, or they should be placed underground. These lines are covered with steam jackets which can burn just as quickly as a live-steam line upon contact.

When mixing cutback asphalt, especially the rapid-curing type containing naphtha, extreme care must be taken to prevent flashing of the volatile materials. Aggregate temperatures should be kept down to the minimum. All open flames should be kept away from the asphalt storage tanks and the pugmill. Should a fire develop in the pugmill, the operator should immediately shut off the asphalt supply, letting the aggregate flow continue. This will snuff out the fire with no damage and relatively little danger. At least two fire extinguishers should be kept at quickly accessible locations on the plant at all times. They should be recharged immediately

(Continued on next page)

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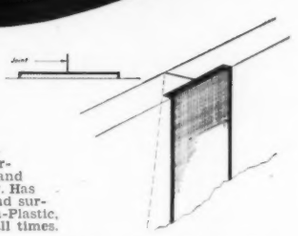

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Safety Suggestions For Asphalt Workers

(Continued from preceding page)

after use and periodically checked for proper contents. Many an asphalt mixer, distributor, or heating kettle have gone up in smoke because of failure to follow these simple precautions.

While on the subject of combustibles, we are reminded that by no means all fuels consumed are burnt inside engines. Field observations have shown the following conditions:

1. Gasoline-storage tanks, unpainted or painted some color other than red.

2. Gasoline-storage tanks, in too close proximity to flame, sparks, etc.

3. Gasoline filler cans not painted red.

4. Open containers of gasoline, used for cleaning, too close to possible point of ignition and with no identifying marking.

5. Fuel-oil tanks not painted the standard yellow.

6. Gasoline engines refueled while running and with red-hot exhaust manifold near at hand.

The above are only a few of the more common conditions seen around construction equipment. The same thing applies, but of course to a lesser degree, with fuel oils. Fuel oil has a considerably higher flash point. Therefore it is not as easily ignited, but when it does start burning it produces a much hotter fire.

In my contacts with construction jobs I've seen many instances where gasoline was placed in a fuel tank, or fuel oil was placed in a gasoline tank, with its obvious potential hazard. Here, I think, perhaps we manufacturers are not doing all we might to prevent this kind of occurrence. Each manufacturer seems to have his favorite color, and to paint a fuel tank other than its standard color would detract from the appearance of the machine. We should, however, plainly mark each fuel tank near the filler opening with the words plainly visible, "Gasoline" or "Fuel Oil".

Plant-Site "Housekeeping"

Just as there are housewives who keep their houses neat and tidy or cluttered and unkempt, so also does one observe a wide variation in the quality of "housekeeping" around various asphalt plants. I have seen some plant sites that could serve as a picnic spot merely by spreading a tablecloth, and I have seen others that were incredibly choked with accumulations of aggregate, dust, grease, asphalt, tools, timber, barrels, etc.

Probably the first consideration for good housekeeping around the plant would be to cover the active area of the plant site with crushed stone, gravel, or sand. If this is not done, practically all soils become very muddy and slippery when wet. Generally rainy days are set aside for certain maintenance work to be done around the plant. It is extremely dangerous to be climbing around on equipment with muddy shoes with the ever-present danger of slipping and falling. In the same vein all surfaces of the plant which accumulate a build-up of dust should be periodically cleaned, as many types of dust become very slippery when wet.

There should be a tool house for storing all tools. There should be a place for every tool and every tool in its place, instead of being strewn around promiscuously over the plant site.

Lumber, timber, blocking, and cribbing should be neatly stored outside the active area of the plant site. Also odd parts and assemblies not in use should be neatly placed in a spot outside the area of greatest activity.

All greasy or oily spots on any portion of equipment where a man might step should be cleaned down to the paint or bare metal to prevent the danger of slipping. All platforms and walkway areas should be kept free from aggregate, tools, or any other material which would be an obstruction to safe walking.

All accumulations of aggregate from overflow spouts, reject chutes, and from any points of spillage around any portion of the plant should be cleaned up and hauled away, preferably at the end of each day's run, or at the end of an operating period where there will be some delay before the plant starts up again. If this is not done, these accumulations pile up to a point where they create a very real and potential safety hazard.

Laying Operation

One of the principal advantages of asphalt paving is that, in most cases, traffic can be maintained while the actual resurfacing is in progress. This very advantage, however, creates an extremely dangerous situation not encountered on other types of paving and road construction where traffic is not maintained. I refer to the possibility of workmen of the laying crew being struck by passing automobiles. It is very easy for a person working on the traffic side of the finishing machine to step backward a few feet. Also a person can absent-mindedly walk around the front of the truck, or across the rear platform of the finishing machine directly into the path of passing vehicles. It should become second nature to look before stepping into the traffic area.

Another potential hazard is in the danger of a workman being crushed between the truck and the finishing machine as the truck backs up to the machine to dump its load. Often a laborer is cleaning the sides of the hoppers, and while so doing, is standing directly in front of the machine. In most cases one man is in charge of the truck dumping. This man should be charged with the responsibility of being continually alert as the truck is backing in to

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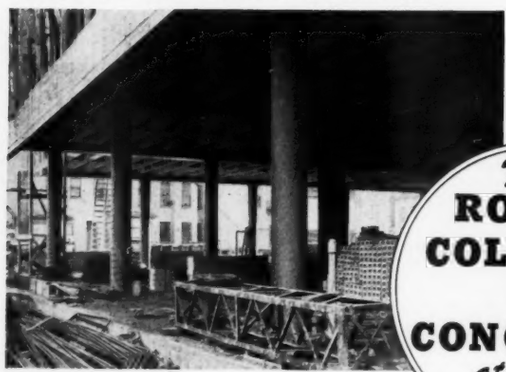

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see that no one is between it and the finishing machine.

We have observed many finishing machines in operation which resembled "Fibber McGee's Closet" turned inside out. The screed assembly seems to be a favorite temporary storage place for shovels, rakes, buckets for grease and fuel oil, gasoline containers, straightedges, hand tampers, as well as a varied assortment of other parts, tools, etc. Of course, the screed unit was not designed for this purpose. Protruding objects create a hazard and the objects mentioned can come in contact with a moving part and cause damage or breakage. Many contractors have solved this problem by having a wheel-mounted trailer to handle these articles, thus improving the safety factor greatly as well as the neatness of the machine.

Organize a Program

Let us now analyze in a more general sense, ways and means through which the asphalt-paving operation can be made a safer place to work. Naturally, the first requisite is to have a functioning safety program applied to all phases of the asphalt-paving project. Even preceding this, however, there must be acceptance by top management that such a program will pay off. Safety can and does pay off in two important ways.

The first is humanitarian in principle as it will safeguard the welfare of the workmen.

The second way in which safety pays off is in increased production, consequently, increased profits. We have as one of our safety slogans at the factory, "You can have safety without production but you can't have production without safety". A man is not employed unless he is capable of performing a labor which, in the over-all operation, leads to profit. If that man is taken out of the picture by injury, the chances are he cannot be replaced immediately, with the consequence that the over-all production suffers. The degree of loss to the operating increases as the skill and ability of the man increases.

Another economic advantage is that an increase in safety in the over-all industry will result in a proportionate decrease of rates paid for accident-compensation insurance.

The second factor in launching a safety program is organization. One man should be made responsible for the entire program. This might be a part-time assignment for the average job or might be a full-time assignment on large projects. The man appointed should be given full authority to purchase necessary safety equipment, to draft procedures, and to assign detailed responsibilities to other members of the crew.

I stated earlier that we have no statistical data regarding safety. That statement was not entirely correct; 98 per cent of all accidents are caused by carelessness, poor judgment, or mental failures. Only 2 per cent are caused by machinery failure. These figures are from the National Safety Council.

The above is only a skeleton approach to an over-all safety program, but contains most of the basic fundamentals. A program launched on these fundamentals will prove conclusively the double-edged slogan—safety is no accident.

From a paper presented at the Southern Safety Conference in Atlanta, Ga., on March 3, 1953.

How to Lay Concrete Pipe

A booklet that tells in nontechnical language how to lay concrete pressure pipe is offered by the Price Bros. Co., 1932 E. Monument Ave., Dayton 1, Ohio.

There is a maximum of four short paragraphs to cover each operation, step by step, and photographs help to clarify the procedure.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 55.

Tractor-Mounted Clam Rig

Literature is available on a clam-bucket attachment for the tractor-mounted digging rig made by the Shawnee Mfg. Co., Inc., 1947 N. Topeka Ave., Topeka, Kansas. The manufacturer stresses that the unit cuts a vertical bank neatly to eliminate squarings by hand. The hydraulic clam cylinders can operate independently. The clam assembly comes with a 24 or 36-inch wide bucket.

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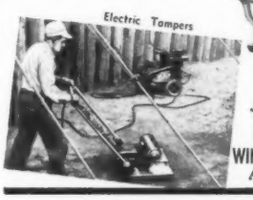
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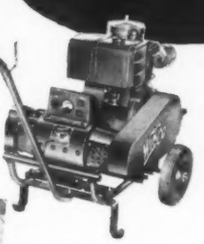

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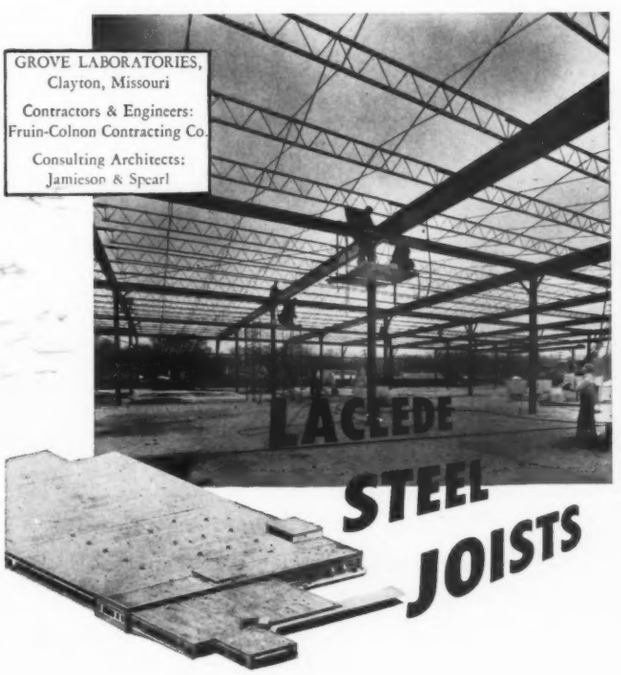

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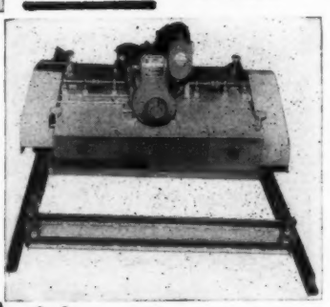

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Contractors Prepare For Keen Competition

Over 1,400 AGC Members Convene in Miami to Assess A Period Marked by the Sharpest Competition in Years

• MORE than 1,400 of the nation's leading general contractors convened in Miami, Fla., early this spring to assess what may be the biggest and most intensely competitive year the construction industry ever witnessed.

The 34th Annual Convention of the Associated General Contractors of America attracted nearly 2,000 people. Sessions were held only in the mornings from March 23 to 26; afternoons were devoted to a number of well attended out-of-doors social functions.

Record Volume

Faced with a record construction volume this year estimated at $44 billion, the nation's contractors focused their attention on the twin task of carrying forward defense construction and an expanded program of civilian projects.

Reports from members all over the country indicated that several important trends have already become noticeable. The removal of Government controls, plus the general availability of materials, has ushered in a period of abundant work characterized by heavy competition, sharp bidding, and lower prices.

The AGC's program for the coming year will be based on the accomplishment of three fundamental goals. H. E. Foreman, the Association's Managing Director, reported these goals as the enactment of Federal legislation, assuring the right of judicial review of disputes arising from decisions of Government departments on Federal construction or other procurement contracts; the defeat of attempts to pass legislation which would require general contractors on Federal projects to name proposed subcontractors and the amounts of their bids; and to be of all possible assistance to Congress as it considers amendments to the Taft-Hartley Act.

Subcontractor Bill

Many members felt that the second goal, the defeat of the new subcontractor relationships bill, was the most pressing problem facing the Association. The Legislative Committee of the AGC issued a statement which criticized Senate Bill S-848 as an attempt to regulate the intimate and internal affairs of the construction industry by Federal law. Provisions of the bill, they added, would require the contractor and the Government agencies concerned to change in part their long established way of contract.

Testimony in the past on similar bills had shown that such a relationship would:

(1) add to construction costs
(2) reduce competition
(3) discriminate against certain specialties
(4) hamper general contractors
(5) add to Government administrative costs
(6) divide responsibility
(7) constitute legislation to regulate industry practice and ethics
(8) add to the Government's legal responsibilities
(9) have a harmful effect on small business

Members were consequently advised to register their opinion with the various members of the Senate Judiciary Committee. In addition, the convention passed a resolution opposing S-848 for the reasons that "such legislation would cause unnecessary Government regulation of business relationships in the construction industry, and would tend to increase the cost of public works construction." The resolution added, however, that "the association continues to offer its cooperation to solve within the industry such problems of the relationships of general contractors with other segments of the industry as may arise."

Highway Financing

Another topic very much at the forefront of the convention was highway financing. Under Secretary of Commerce Walter Williams lashed out during the first session against "intolerable" traffic conditions in this country and warned that the next 10 years would bring an even worse situation unless a means was found of increasing the capacity of our highways.

Mr. Williams told the AGC that the nation's highway system is in its "infancy." And, he added, the size of the present highway construction program "gives no particular assurance that we shall better conditions in the future."

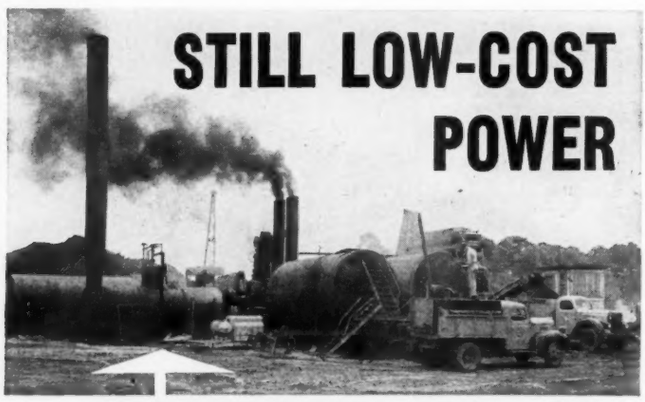
On the subject of financing, the Under Secretary of Commerce suggested that "the highway users should pay a more direct portion of the cost of these highways; in other words that we should have more toll roads. We are not attempting to provide the answer to the problem in these remarks. We are merely pointing out the fact that our highway construction program is scarcely keeping pace with the demands being placed upon it."

The toll-road idea, however, did not receive unanimous support at the meeting of the AGC's Highway Contractor's Division. Many felt that while toll roads provide the best answer in highly traveled areas, it would be unwise for all states to adopt such programs.

In his National Staff Report to the Highway Division, A. N. Carter, Division Manager, pointed to the increased attention now being paid to toll-financing. He reported that 750 miles of toll facilities were already built, almost 1,000 miles under construction, and an additional 500 miles authorized.

Non-Toll Financing

Non-toll financing was also discussed at length by the highway contractors. It was the unanimous opinion of the group that the most



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immediate method of increasing highway revenue would be to eliminate all types of diversion. Mr. Carter's report had revealed the great scope of both state and Federal diversion. Consequently, the Division adopted a resolution that recommends to Congress and the states that:

(1) The Federal government assume its proper responsibility for the nation's highway needs by increasing Federal-Aid returns to the states of not less than the total amount of funds collected in taxes from highway users.

(2) The Federal-Aid highway-construction program be administered through present channels.

(3) There should be no diversion to other purposes of tax funds collected from highway users by any unit of government.

The highway contractors also heard a report by a special committee on specifications of defense agencies for grading operations and bituminous paving. It was decided that this committee continue its work with special attention directed toward making compaction and test sections pay items in future Corps of Engineers work.

Building Division

The Building Contractors Division of the AGC also called on the Corps of Engineers to improve its specifications. A special committee reported that much had already been done on this problem following the Corps' directive to district engineers to free specifications from generalities and indefiniteness.

Safety

Continuing its vigorous support of accident prevention, the AGC passed a resolution recommending further expansion and improvement of the present safety program. The Association also expressed strong "opposition to legislation by Congress for the supervision of industrial safety regulations, on other than Federally-financed projects, for the reasons that such legislation is an unwarranted assumption of authority vested in the states, and that the industry can carry out more effective safety measures on a voluntary basis."

H. B. Alexander, Chairman of the Accident Prevention Committee, called upon the members for greater cooperation in 1953. He described the Association's method of helping the contractor "feel his accident 'pulse' and find out his prevention 'temperature'." By reporting his total payroll hours for a given period, the number of accidents causing lost time, and the total days of lost time, the AGC can compute his frequency and severity rate. The contractor is assigned a key number which he can compare with those of other members. Thus no one's record is exposed but he can compare his with all others.

Other Resolutions

Other resolutions were passed recommending agencies to conform to prevailing wage scales in the community, stabilization of wage scales, the right of judicial review, adequate pay for engineers, construction by contract, and agency responsibility for abnormal hazards.

Convention Speakers

Notable speakers at the convention were Carlton S. Proctor, Past President of the American Society of Civil Engineers; Maj. Gen. S. D. Sturgis, Jr., Chief of the U. S. Army Corps of Engineers; and Capt. A. D. Hunter, Deputy Chief of the Bureau of Yards and Docks, U. S. Navy.

Calling for a "spiritual mobilization coincident with our material mobilization," Carlton S. Proctor declared that Americans must free themselves of their fear of the atom bomb and direct their attack to the "roots of confusion and decaying morale", if they are to preserve liberty in this country and provide leadership for the world.

Mr. Proctor said that "neither fear of a destructive force beyond man's comprehension, nor the exploitation of such fear" alone could account for the present challenge to the basic principles on "which our nation has grown." He deplored the "softening of our moral fiber and loss of spiritual values" which he said were responsible for the trend to collectivism in this country, a trend, he declared that has been temporarily arrested by the results of the last election.

Maj. Gen. Sturgis

America is faced with a defense-construction job that is tougher than the tasks that were imposed during World War II, according to Maj. Gen. S. D. Sturgis, Jr., Chief of the U. S. Corps of Army Engineers.

"If anything," he said, "the jobs we are doing and the jobs we will be called upon to do exceed the World War II requirements for ingenuity and careful planning.

"For today we must plan our defense construction to meet future needs that are not always positive. The military construction program today is necessarily based on decisions subject to changes generated by the continual shifts and maneuvers of global strategy."

Gen. Sturgis said today's task poses a tough problem because "we are charged with accomplishing this mission efficiently and economically in areas where comparable major construction has never before been attempted."

Wartime Schedules, Peacetime Rules

"The problems are numerous and the presently available solutions at best are only partial," the Chief of Engineers declared. "We are assigned schedules comparable to wartime, and given a set of peacetime rules."

So it is, he declared, that "the Corps of Engineers or the contractor is criticized before all the facts are known."

The number one problem for both the Government and contractor is personnel, he said, because there are too few skilled men and too many jobs requiring a high degree of skill. This difficulty is compounded, he said, by the task of recruiting men from this limited pool of talent for overseas jobs. Another problem faced after recruitment is retention of personnel on the job for the period prescribed in the employment contract, Gen. Sturgis stated.

Little-known facts about the much-publicized construction of airfields in French Morocco were revealed by the General. He said the Corps of Engineers was ordered to build them on an all-out, top priority basis with speed as the principal factor.

"The State Department negotiated a basic agreement with the French Government in December, 1950," he said. "While these negotiations were under way, we had started to work assembling equipment, materials, and men. The first plan was to expand and strengthen four existing French fields and to build one new field as

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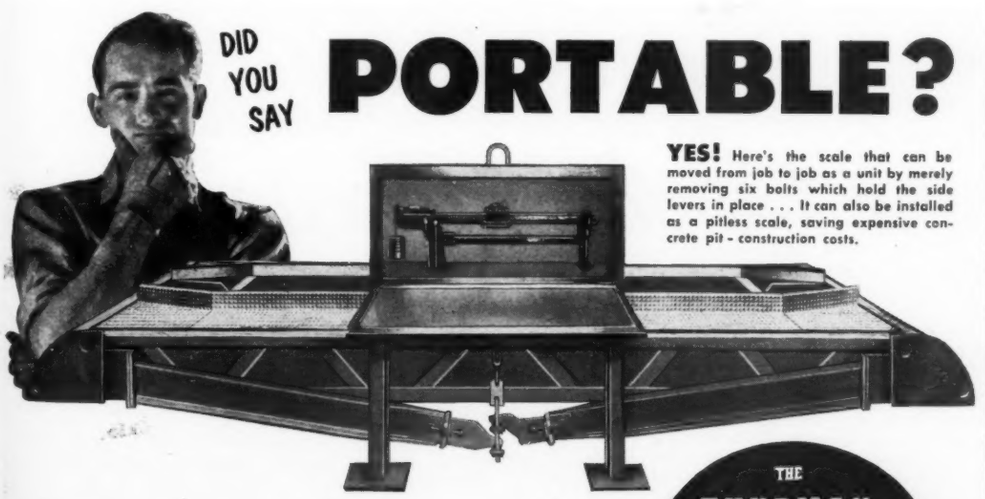
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Contractors Prepare For Keen Competition

(Continued from preceding page)

a general supply depot to support operations. All were to be operational within six months after we entered the country. In January, 1951, the Air Force clarified the target date for operations and specified that four fields be ready by July 1, 1951, and the depot base by October of that year. The Air Force recognized also that designing and construction would somehow have to be simultaneously accomplished.

New Plans Given

"In the meantime, on-the-spot negotiations were in progress between the local French authorities and the Air Force to develop detailed arrangements for construction and Air Force occupancy. They were not concluded until mid-April. We were not permitted to ship contractor employees into the country in any reasonable number until the negotiations were complete. And, in the meantime, we were given plans to build five entirely new airfields. I don't have to describe the effect that decision had regarding the amount of dirt yardage and rock tonnage to be moved in the then remaining two and one-half months while the July 1, 1951 completion date remained the same. It was tremendous. But as good soldiers, we tried.

"The first dirt was moved at the depot base on April 22, almost four months after the original arrangement had been made with the French. We started work at another site on May 9. The pressure for speed was intensified over and over again. Yet, in spite of the accordioning of the contractors' time by our sister services in their attempts to work out with the French a basis for our operations in North Africa, in less than 90 days both of these fields received their first flights of B-29 bombers and jet fighters.

"This job, plagued with shifting site problems, funding difficulties, the constant pressure of speed, and located at remote sites in a backward area, is one of the most dramatic construction jobs ever carried out.

"History may someday determine how important the early availability of those fields was to the security of our country.

"There is no priority on time. When we have to buy time it comes at premium price, inevitably. Work can be done at high speed or it can be done at an economical pace. But it can't be both. So those who accordion time generally should be prepared for some one to let out a hell of a wail before the movement is complete."

Capt. A. D. Hunter

Construction completed for the U. S. Navy or under contract during the year ending March 1, 1953, totals $1,249,000,000, said Capt. A. D. Hunter, Deputy Chief of the Bureau of Yards and Docks, U. S. Navy. "Such a program, of course," he stated, "can't get anywhere without the cooperation of the contracting industry."

Capt. Hunter said he was unable to state in definite figures just what the future construction program of the Bureau would be, due to the present restudying of the budget.

"The new administration in Washington, I am told, hopes to be able to spell out its program and course in some detail by May," said Capt. Hunter.

He called for patience while the screening of construction projects for essentiality is in progress.

"The screening process that I have talked about is simply this," said Capt. Hunter. "All projects not yet under construction must be rejustified to the Secretary of Defense. In addition, any project that is under way and less than 20 per cent complete must also be rejustified.

"What this means to our program in the Navy is just about as follows: We have had appropriated for public works construction during the last three fiscal years slightly more than $1,800,000,000. On March 1, 1953, $1,249,000,000 of this amount was under contract, leaving an unobligated balance of roughly $550,000,000.

"The word 'unobligated' here is a misnomer. Some of this total will not be put under contract due to program changes, necessary delays, etc. Some is reserved for change orders, Government expenses incident to the program, etc. Our best estimate at present is that something in excess of $400,000,000 remains to be put under contract. Without the present freeze, about $300,000,000 of this would have been under contract by September 1, 1953."

New Officers

C. P. Street, building contractor of Charlotte, N. C., was elected President of the AGC for 1953. John MacLeod, of Paramount, Calif., was elected Vice President.

Mr. Street, who is Secretary and General Manager of McDevitt & Street Co., of Charlotte, succeeds A. S. Horner, of Denver, as Head of the AGC. William Muirhead, of Durham, N. C., is Secretary-Treasurer, a permanent office.

A native of Cadiz, Ky., where he was born in 1900, Mr. Street was graduated from Vanderbilt University, Nashville, Tenn., in 1922. In the same year he accepted a position with the McDevitt-Fleming Co., now McDevitt & Street Co. He has served the same firm with increasing responsibilities since then and has held his present position as Secretary and General Manager since 1940.

Mr. MacLeod was born in Scotland in 1893. He has been President of his firm since 1929 and is noted as a builder of dams, Army and Navy ordnance test stations, air bases, supply depots for armed forces, amphibious force installations, and industrial facilities, particularly for the oil industry.

Martin Joins Trailmobile

George Martin, formerly with Willys-Overland Motors, has been appointed General Service Manager of Trailmobile, Inc., a subsidiary of Pullman, Inc., Cincinnati 9, Ohio. Mr. Martin succeeds E. W. Barnekoff, who becomes Director of Purchases.

Trailmobile, Inc. manufactures commercial truck-trailers.

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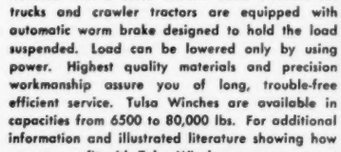


This Model 10 Tulsa Winch is used by a commercial chemical fertilizer manufacturer to spot freight cars for loading and unloading. It is powered by an electric motor and does not use lever controls.

Tulsa* Winch
TULSA, OKLAHOMA — DIVISION OF VICKERS Inc.

*Reg. U. S. Pat. Off.

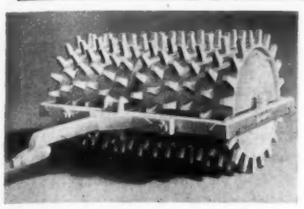
The Model 142 Terra Cobra.

New Scraper Has Ten Speeds Forward

A 17.5-yard 2-wheel tractor-type self-propelled scraper has a transmission providing ten speeds forward and two in reverse. This is said to give a gear ratio for maximum efficiency under all load and haul conditions, and permits speeds to 35 miles per hour.

Powered by a 225-hp Cummins diesel, the Terra Cobra 142 has open-bowl design, 25-inch ground clearance, and short turning radius. The air-operated power-control unit operates through a separate takeoff, independent of the master clutch. The unit has hydraulic steering. Capacity is 14.0 cubic yards struck.

For further information write to the Wooldridge Mfg. Co., Sunnydale, Calif., or use the Request Card at page 18. Circle No. 48.



New Tamping Roller

A new heavy-duty tamping roller has been announced by Southwest Welding & Mfg. Co., 3201 W. Mission Road, Alhambra, Calif. The Model 2D10-WS has twin drums with wedge-type feet. When loaded with sand it exerts a tamping pressure of 1,250 psi. Water ballast may be used for lighter pressures.

The new roller has an oscillating yoke which is said to allow a full tamping effect on uneven ground. The drum is 5 feet in diameter and 5 feet long.

For further information write to the company, or use the Request Card at page 18. Circle No. 103.

Tractor and Attachments

Literature is available on a light-job tractor made by the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. The Farmall Cub, which delivers 8.9-drawbar hp, is shown with a variety of attachments and on diversified work. There are illustrations of the tractor supplying power for grading, hauling, leveling, sweeping, spraying, mixing concrete, and excavating. Many of the attachments are sold by International Harvester.

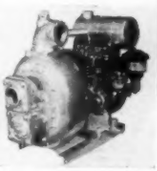
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 81.

Concrete-Curing Compounds

A new brochure on concrete-curing compounds is available from the Hunt Process Co., Inc., 7012 Stanford Ave., Los Angeles 1, Calif., or Hunt Process Corp., Southern, Ridgeland, Miss. The booklet explains where each of the compounds made by the company may be used. General directions are given and hand and power spray equipment are described.

According to the manufacturer a gallon of the company's curing compound will cover 200 to 300 square feet.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 53.



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INDEX TO ADVERTISERS

(Continued from page 131)

Storer Decal Co.	117
Stoody Co.	19
Stulz Sickles Co.	20
Swenson Spreader & Mfg. Co.	99
Symons Clamp & Mfg. Co.	21
Syntron Co.	92
Tarrant Mfg. Co.	49
Teale & Co.	32
Templeton, Kenly & Co.	123
Texas Co.	2, 10, 11
Thew Shovel Co.	103
Thompson Chemicals Corp.	50
Throwaway Bit Corp.	109
Thruman Scale Div.	127
Tilden Tool Mfg. Co.	124
Timken Roller Bearing Co.	75
Tractor Spreader Co.	122
Transport Trailers, Inc.	84
Traylor Engrg & Mfg. Co.	104
Tri-Line Co.	116
Tulsa Winch Div.	128
Union Wire Rope Corp.	32
U. S. Rubber Co.	99
United Steel Fabricators, Inc.	78
Universal Engineering Corp.	94, 95
Universal Form Clamp Co.	40
Universal Pulleys Co.	98
Van Brush Mfg. Co.	80
Vibro-Plus Products, Inc.	110
Visking Corp.	56
Vulcan Iron Works	128
Vulcan Tool Mfg. Co.	82
Watson-Stillman Co.	121
Waukesha Motor Co.	21
Wellman Engineering Co.	108
White Mfg. Co.	122
Whitestown Trencher Co., Inc.	60
Wincharger Corp.	125
Winpower Mfg. Co.	124
Winslow Scale Co.	63
Wood Mfg. Co.	114
Worthington Corp., Construction Equip. Div.	69
Worthington Mower Co.	70
Wright Power Saw	127
Wyzenbeek & Staff, Inc.	129

Manufacturer Memos

District Sales Engineers Appointed by Granco Steel

Four district sales engineers have been appointed to represent Granco Steel Products Co., Granite City, Ill., in major midwestern cities. Granco Steel Products, a wholly owned subsidiary of the Granite City Steel Co., manufactures Corruform, Cofar, Tufcor, etc.

The four sales engineers and their assigned cities are: Charles E. Eck, Kansas City, Mo., with offices at 1016 Baltimore Ave.; Olaf O. Roberts, Chicago, Ill., whose headquarters are at 112 S. Michigan Avenue; Fred B. Kallmayer, St. Louis, Mo., who works out of the company headquarters in Granite City; and F. Alan Tiarks, Dallas, Texas, with offices at 3200 Maple Avenue.

Schoen Joins LeTourneau

John W. Schoen has been appointed Vice President and General Sales Manager of R. C. LeTourneau, Inc., Peoria, Ill., maker of earth-moving and construction equipment.

Bringing to LeTourneau extensive knowledge of business administration and practical experience in the construction - equipment industry, Mr. Schoen is directing the company's sales division as well as other related departments. He was previously associated with David Brown Industries, a British manufacturer of construction equipment, and was Vice President of LaPlant-Choate Co., Cedar Rapids, Iowa.

John W. Schoen, LeTourneau's new Vice President and Sales Manager.

Promotions in Koppers Co.

A. B. Fisher, Jr., is the new Assistant General Manager of the Engineering and Construction Division of Koppers Co., Inc., Pittsburgh, Pa., and G. P. Wilson, Jr., is Manager of Control. The latter will supervise the Division's finances and budgetary functions. Other appointments in the Division are: R. J. Sprott, Assistant Production Manager; C. S. Carder, Chief Engineer; A. D. L. Orefice, Assistant to Mr. Carden; and C. G. Barnett, Manager of the By-Product Section of the Division's Engineering Department.

On the sales side of the organization, Harry P. Neher, Jr., has been appointed Assistant Manager of the Central Staff Sales Department, and George C. Miller is Manager of the International Product Sales Section.

New Hyster Manager

William M. Campbell is the new Manager of the Peoria, Illinois, Division of Hyster Co., Portland, Oreg., manufacturer of winches, tractor tools, and attachments. He succeeds Theron Howard, who is retiring from business. Mr. Campbell started with the company at Portland in 1940, and later transferred to the Peoria office, where he became Office Manager and eventually Assistant Secretary and Assistant Treasurer. He will continue to hold the two latter posts along with his new appointment.

Ronald B. Bergston, formerly Chief Accountant, succeeds Mr. Campbell as Office Manager.

Walter J. Kallmeyer, newly appointed Chief Engineer of Standard Steel Corp., Los Angeles, Calif.

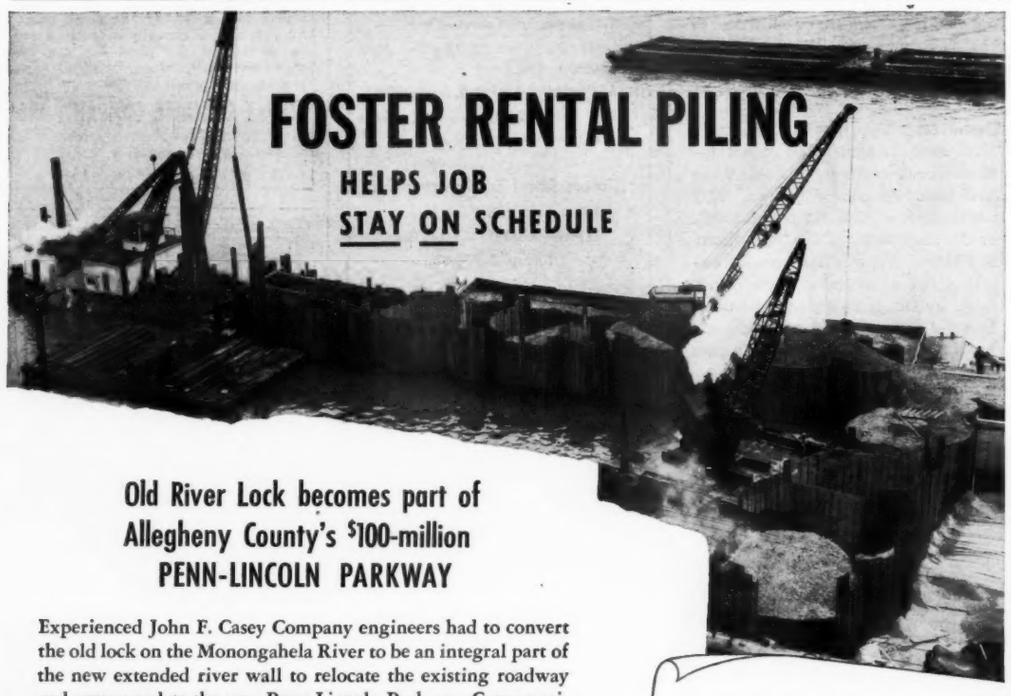
Kallmeyer for Steel Firm

Walter J. Kallmeyer, former Manager of Blaw-Knox, Blawnox, Pa., has been appointed Chief Engineer of Standard Steel Corp., Los Angeles, Calif., west-coast manufacturer of asphalt plants, road-construction machinery, rotary dryers, and specialized processing equipment. Mr. Kallmeyer has been associated with heavy-steel fabrication since 1924.

Two Timken Promotions

The Timken Roller Bearing Co., Canton 6, Ohio, has named Robert G. Morgan District Manager of the Moline, Ill., office. Mr. Morgan has been with the company since 1937.

Robert L. Williams, with Timken since 1938, will be District Manager of the St. Thomas, Ontario, office.



Old River Lock becomes part of Allegheny County's $100-million PENN-LINCOLN PARKWAY

Experienced John F. Casey Company engineers had to convert the old lock on the Monongahela River to be an integral part of the new extended river wall to relocate the existing roadway and accommodate the new Penn-Lincoln Parkway. Casey engineers drove cellular cofferdams averaging 23'9" in diameter to keep water seepage to the minimum on this tremendous engineering project. Their careful planning insured an efficient, uninterrupted work schedule in constructing the river wall, and an important part of the schedule depended on Rental steel-sheet Piling from Foster. Foster delivered ahead of schedule, in the exact sections (MP-112) and in the specified lengths.

On your next Piling job, call Foster for the exact sections, in the exact lengths . . . on the job when you need it, and at Foster's standard low rental rates that allow considerable saving.

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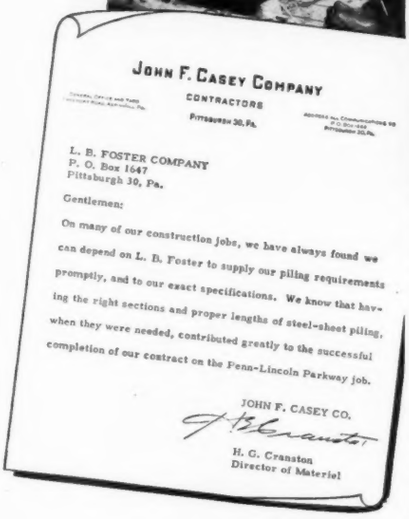

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INDEX TO ADVERTISERS

Acrow, Inc. 89
Adams Mfg. Co., J. D. 46, 47
Aeroil Products Co., Inc. 62
Aetna Casualty & Surety Co. 85
Air Placement Equipment Co. 79
Allison Div., of GMC 59
Allis-Chalmers Tractor Div. 87
All-Purpose Spreader Co. 115
American Hoist & Derrick Co. 82
American Manganese Steel Div. 21
American Steel & Wire Div. 15
Arps Corp. 115
Austin-Western Co. 97

Ballard, C. L. 121
Barber-Greene Co. 33
Barco Mfg. Co. 25
Bethlehem Steel Co. 120
Bing Transfer Signs 109
Blaw-Knox Equip. Div., Blaw-Knox Co. 23
Blum & Co., Inc., Julius 19
Borden & Riley Paper Co., Inc. 96
Bradford Machine Tool Co. 58
Browning Crane & Shovel Co. 22
Bruning Co. 96
Brushmaster Saw, Inc. 117
Bucyrus-Erie Co. 52, 53
Buffalo-Springfield Roller Co. 16

Canton Mg. Co 34
Carver Pump Co. 92
Caterpillar Tractor Co. 7, 14, 131
Celotex Corp. 111
Chausee Mfg. Co., Inc. 105
Chevrolet Motor Div., GMC 17
Chicago Pneumatic Tool Co. 29
Chrysler Corp., Marine & Industrial Engine Div. 57
Cleaver-Brooks Co. 24
Cleco Div., Reed Roller Bit Co. 77
Cleveland Trencher Co. 93
Colorado Fuel & Iron Co., Wickwire Spencer Steel Div. 105
Complete Machinery & Equip. Co., Inc. 122
Concrete Surfacing Machinery Co. 111
Construction Machinery Cos. 110
Continental Motors Corp. 58
Continental Rubber Works 74

Dalton Mfg. Co. 68
Dart Mfg. & Sales Co. 13
Davey Compressor Co. 86
Detroit Diesel Engine Div., GMC 76
Diamond Chain Co., Inc. 37
Dixie Tallyho, Inc. 110
Dixon Valve & Coupling Co. 70
Dodge, Div. of Chrysler Corp. 33
Dorsey Trailers 100
Dotmar Industries, Inc. 125
Drake-Williams-Mount 107
Drott Mfg. Corp. 51
Dudgeon, Inc., Richard 9
Duff-Norton Mfg. Co. 93

Eagle Crusher Co., Inc. 126
Eaton Mfg. Co. 62
Economy Forms Corp. 104
Eimco Corp. 12
Engineered Equipment Co. 35
Essick Mfg Co. 90
Euclid Road Machinery Co. 65

Felker Mfg. Co. 60
Flexible Steel Lacing Co. 72
Ford Motor Co. 81
Foster Co., L. B. 130
Foundation Equipment Corp. 29

Galion Allsteel Body Co. 51
Gar-Bro Mfg. Co. 41
Garrison Mfg. Co. 98
Gar Wood Industries, Inc., Findlay Div. 90, 91
General Steel Tank 49
Gladden Products Corp. 74
Goodrich Co., B. F. 73
Goodyear Tire & Rubber Co. 5
Gorman-Rupp Co. 80
Grace Mfg. Co., W. E. 116
Gradall Div. of Warner & Swasey 9
Griffin Wellpoint Corp. 118
Gunderson-Taylor Machinery Co. 101

Harnischfeger Corp. 31
Hayward Co. 81
Hazard Wire Rope Div., Amer. Chain & Cable Div. 83
Heil Co. 26, 27, 114
Hendrix Mfg. Co., Inc. 68
Highway Equipment Co., Inc. 20
Hobbs Corp., J. W. 70
Hoffco, Inc. 112
Hopkins Volcanic Specialties, Inc. 98
Hotel Wisconsin 129
Hough Co., Frank G. 44, 45
Hunt Process Co. 119
Hyster Co. 119

Insley Mfg. Corp. 18
International Harvester Co. 54, 55
Iowa Mfg. Co. 112

Jackson Mfg. Co. 72
Jackson Vibrators, Inc. 102
Jaeger Machine Co. 109
Johnson Co., C. S. 43
Joy Mfg. Co. 50

K & N Machine Works, Inc. 107
Koehring Co. 43
Kotal Co. 71
Kwik-Mix Co. 43

Laclede Steel Co. 125
Lansing Co., 113
LeBus Rotary Tool Works, Inc. 106
Levelall 113
Lenker Mfg. Co. 101
Leschen & Sons Rope Co., A. 49
LeTourneau, Inc., R. G. 132
Littleford Bros., Inc. 101
Lubriplate Div., Fiske Bros. Refining Co. 18
Lucey Boiler & Mfg. Corp. 121
Lufkin Rule Co. 123

Macleod Co. 84
Madsen Iron Works, Inc. 34
Marlow Pumps 84
Marsh Co. 30
Martin Machine Co. 30
Marvel Engineering Co. 61
Marvel Equipment Corp. 100
Master Vibrator Co. 56
McConnaughay Co., K. E. 13
McKiernan-Terry Corp. 118
McKinney Drilling Co. 89
McKissick Products Corp. 79
Mead Specialties Co. 112
Messenger Vibrators 75
Michelin Tire Corp. 6
Miller Research Engineers 29
Miracle Decal Co. 129
Morin Mfg. Co., Inc. 72
Morse-Starrett Products Co. 78
M-R-S Mfg. Co. 66, 67

Ohler Machinery Co. 129
Omaha Standard Body Corp. 48
Owen Bucket Co. 48

Parsons Co. 42
Phillips Power Sod Cutter 113
Pioneer-Gen-E Motor Corp. 17
Pitman Mfg. Co. 28

"Quick-Way" Truck Shovel Co. 35
Quinn Wire & Iron Works 16

Red Wing Shoe Co. 97
Reinhardt Co., Inc., Paul 96
Rice Pump & Machine Co. 120
Rockford Clutch Div. 108
Roebling's Sons Co., John A. 64
Roeth Vibrator Co. 128
Rosco Mfg. Co. 28
Rucker Co. 85

Safway Steel Products Inc. 20
Sasgen Derrick Co. 69
Sauerman Bros., Inc. 48
Servicized Products Corp. 14, 123
Sinclair Refining Co. 63
Slope Meter Co. 74
Smith Engineering Works 71
Soilaire Industries 108
Sonoco Products Co. 124
Sprague & Henwood, Inc. 83
Standard Steel Works 106
Sterling Wheelbarrow Co. 91

(Continued on page 129)

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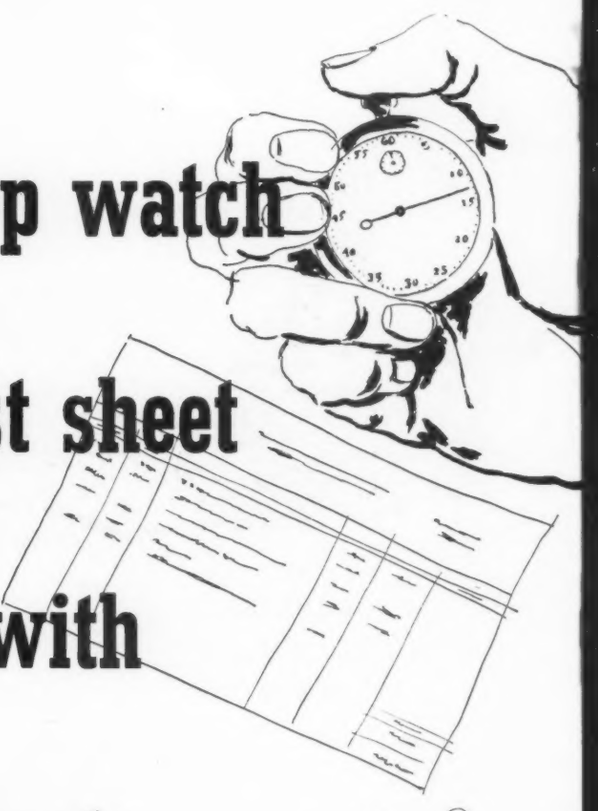

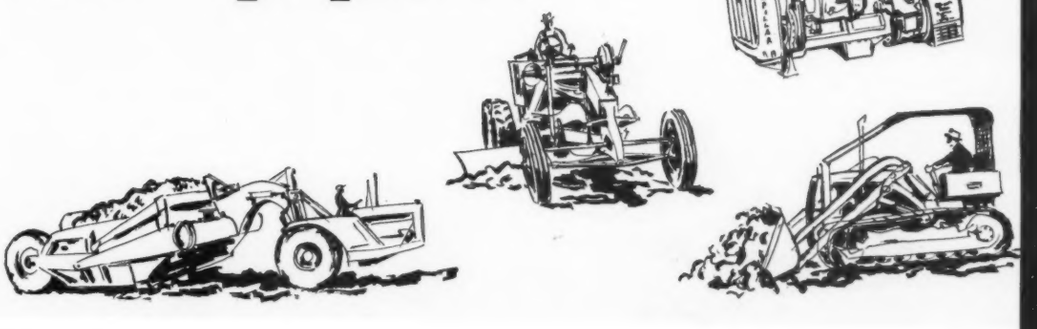

THERE'S one way to find out whether you're making all the profit you're entitled to. Get out your stop watch and cost sheets. Tally your cycle times and production figures. Check your down time and the resale value of your machines. These figures will convince you of Caterpillar superiority.

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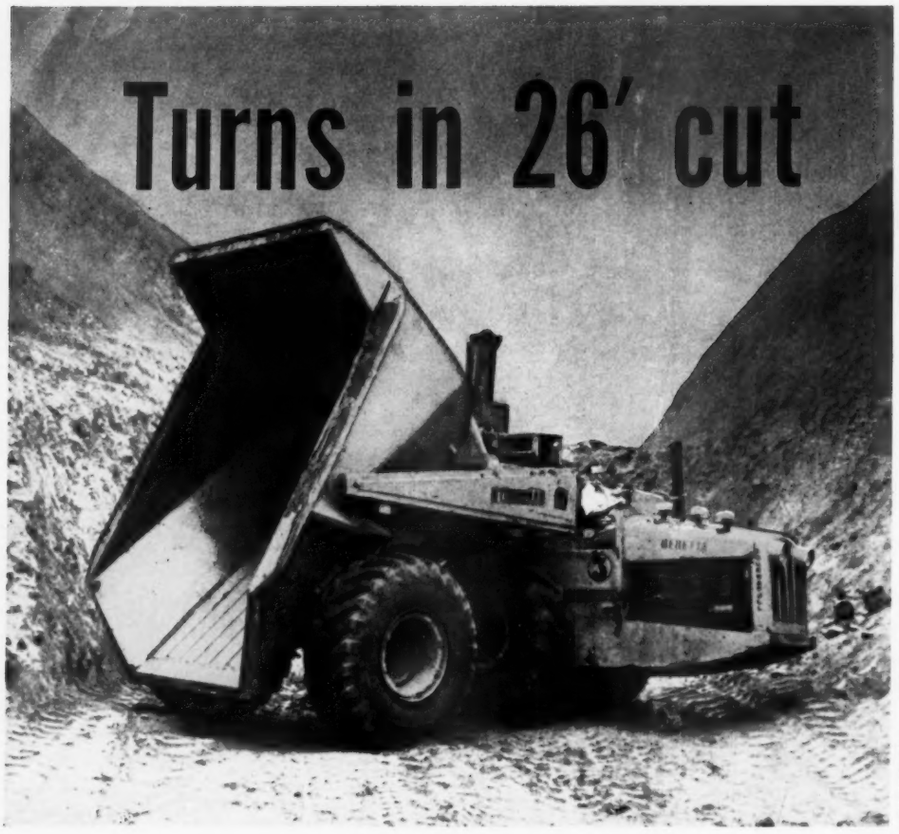

Hauling up and down 6% grades, 165 h.p. Tournarockers complete typical 8140-ft. cycle in 20 minutes. Tournapulls, driven under their own power from Sao Paulo to the project site, made the 250-mile trip in 2 days.

"Tournarockers (with electric hoists) save 2 to 3 minutes per cycle over conventional trucks (with hydraulic hoists)," reports Mr. Sala. Loads are dumped and spread while unit is moving; dozer does only fine-grading.

Maneuverability of LeTourneau earthmovers speeds Brazilian railroad relocation

Ability to turn around within this 26-ft. wide railroad cut and, later, to dump and spread loads while moving, are two major reasons why Escritorio Tecnico Cesar Francisco Beretta e Novi Ltda., prominent Sao Paulo, Brazil contractors, are so enthusiastic about their 2 new rear-dump Tournarockers.

Photos show these LeTourneau machines on a 654,000-cubic yard relocation of the Araraquara Railroad at Jurupema near the Mato Grosso-Sao Paulo State border.

Move 392,000 cu. yds. in 100 days

Loaded by a 1½-yd. shovel, in the first 100 working days, the 2 Tournarockers moved 78,000 cu. yds. of blasted sandstone and compacted clay from this narrow cut, according to contractors' records. Elsewhere on the project in the same 100 working days, 6 C Tournapulls push-loaded in sandy loam and clay, hauled and spread 314,000 cu. yds. Hauls one-way, on both sections, averaged 4250 ft.

The remaining yardage, mostly rock, will be moved entirely by Tournarockers. Contractors will augment their present fleet of these rear-dump units by interchanging several of their Tournapull 2-wheel prime-movers from their present Scrapers to extra Rear-Dump haul units.

Need less maintenance

"This interchangeability of Scrapers and Rear-Dump Haulers makes money for us," says Giovanni Sala, Project Manager and Chief Engineer for Beretta e Novi. "Tournarockers are the only machines I know which will dump on the fill similar to bottom-dumps and over banks as end-dumps. Their short turning radius saves construction of access roads and turn-arounds in single roadbed cuts — thus reducing the amount of extra dirt which has to be moved and increasing profits. Tournarockers' strong, simple construction, without springs or chassis, cuts down maintenance and repairs."

Like Beretta e Novi, who have just purchased 4 additional Tournapulls (increasing their LeTourneau fleet to 12 units), scores of progressive contractors are taking advantage of the dependability and speed of these rubber-tired machines to move earth fast under difficult conditions. They report the interchangeability of Scrapers, Rear-Dump *and* Bottom-Dump haulers behind the same prime-mover greatly reduces equipment cost. Should *you* be interested in these economies, see your LeTourneau Distributor. He will be glad to help you analyze your equipment needs, make cost estimates, or get in touch with contractors who can put these high-speed earthmovers to work for you.

R. G. LeTOURNEAU, INC.
Peoria, Illinois

"Construction of Tournarocker body gives excellent target for shovel operator and helps speed loading time," says Mr. Sala. Note wide top opening (8 x 12') and low entry (8') at rear of body. Reinforced all-steel bowl eliminates most loading shock damage and maintenance troubles. Loads in blasted sandstone, rock and tightly-compacted sandy clay averaged 10.5 cu. yds.

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